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Global Evidence of the Impact of the COVID-19 Pandemic on Affordable Housing and Housing Supply: A Meta-Analysis

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Abstract

The COVID-19 pandemic significantly affected various aspects of life and the majority of industries all over the world. While extant studies have reported the impact of the pandemic in various sectors and industries, the impact of the pandemic on global affordable housing and housing supply has not received sufficient attention. Therefore, this study provides a global comparative evaluation of the impact of the COVID-19 pandemic on the twin issues of affordable housing and housing supply. Google Scholar, Science Direct, ResearchGate and Primo Search were used in conducting database searches for previous studies published within the period of the COVID-19 pandemic (2020-2023). The framework of Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) was adopted in the systematic selection of 37 extant studies. Bibliometric, content and thematic analyses were conducted for the qualitative data analyses. Findings showed that the COVID-19 pandemic impacted various issues, viz: housing prices, demand and supply, socioeconomic gaps, housing construction activities, informal sector housing conditions, government housing policies, mortgage repayment defaults, multidimensional matters, increased digital nomads, and elderly housing supply. This study is unique in providing a systematic appraisal of extant studies to report the global implications of the COVID-19 pandemic on affordable housing and housing supply. Findings of the study are based on a systematic review of the literature. Indeed, the study offers a global perspective on the impact of the pandemic on the blighted affordable housing situation of different countries. Pertinent gaps in the existing literature and areas for further research were identified, alongside the recommendation of policy pathways for the future.

Keywords: Affordable Housing; COVID-19 Pandemic; Global Impacts; Housing Supply

1.0 Introduction

In the thick of the COVID-19 pandemic, the world witnessed a series of unprecedented events

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and scenarios with far-reaching implications on various aspects of society. Particularly disrupted by the pandemic were entire industries and sectors of national economies, leading to business closures, job losses and recessionary pressures (Cassells et al., 2020; Otache, 2020). The pandemic claimed millions of lives worldwide and put a heavy strain on hospitals and healthcare systems (Ioannidis, 2020; Sharma et al., 2020; Worldometer, 2023). As a response to the pandemic, companies resorted to remote work and other measures, leading to impacts on work habits, housing demands and office dynamics (Mantesi et al., 2022; Nayal et al., 2022). Moreover, the pandemic created disruptions in supply chains and led to shortage of not only essential items but also of housing (Al-Mansour & Al-Ajmi, 2020; Uchehara et al., 2020). This impact continues to evolve as countries adapt to changing circumstances and work to recover from the effects of the pandemic. One thing is certain, however: the pandemic highlighted the importance of international collaboration in responding to issues and crises of a global nature (Kim & Cho, 2021).

Affordable housing and housing supply are significant challenges faced by many countries today. Prior to the outbreak of the pandemic, studies had decried the unwholesome state of different aspects of housing in various parts of the world. Many of the studies called on governments and other stakeholders to "hold the reins" and "prevent a free-fall" in housing situations (see Rosen, 2020; Desmond, 2022; McClure, 2010). Among the study findings are that rising housing costs now outpace income growth (Anthony, 2022), that there is a shortage of affordable housing units (McClure, 2010), that there is increased competition for available land (Fritsche et al., 2010), that gentrification processes mostly end up displacing low-income residents (Weller & Van Hulten, 2012), that there is inadequate government funding for affordable housing programmes (Desmond, 2022), that the cost of materials, labour and construction permits is increasing (Ohanian, 2021), that there is widespread income inequality (Fuller et al., 2020), that homelessness has resulted from housing affordability issues (Stonehouse & Hodgkin, 2023), and that housing credit is inaccessible (Reyes, 2020). Without a doubt, the COVID-19 pandemic worsened the existing affordable housing crisis in many parts of the world. It has also underlined the critical need for affordable and stable housing, especially during times of economic uncertainty and public health emergencies.

With regard to the impact of the pandemic on affordable housing and housing supply worldwide, there is a gap in the literature; therefore, this study aims to fill the gap using the method of meta-analysis. The study examines the impact of the COVID-19 pandemic on the global affordable housing and housing supply situation by analysing reports from different countries. The study has the following objectives:

1. to appraise the geographical spread of publications on the impact of the COVID-19 pandemic on affordable housing and housing supply in various parts of the world;
2. to examine the issues that were discussed in the extant publications concerning COVID-19, affordable housing and housing supply;
3. to evaluate the combined impact of the pandemic on affordable housing and housing supply from a global perspective.

After this background to the study, the next section presents the study methodology, followed by the presentation of the results and discussions. The fourth section presents the concluding remarks and policy recommendations, while the last section identifies the limitations of the study and suggests areas for further studies.

2.0 Methodology

The methodological thrust of this study is a review of past studies on affordable housing, housing supply and COVID-19 using the systematic review of literature with meta-analysis. Several past studies have adopted the systematic review of literature and meta-analysis to address focused

research problems. Studies have adopted the procedure in various fields, including surgery (Buchwald et al., 2004), medicine (Mottillo et al., 2010; Yao et al., 2019), public health (Byambasuren et al. 2020), mental health/psychiatry (Coventry et al., 2021; Jay et al., 2022), engineering (Moayedi et al, 2020), agricultural economics (Salajegheh et al., 2022; van Haaften et al., 2021), building construction (Wuni & Shen, 2020), real estate (Chen et al., 2022; Kim et al., 2017; Ogunbiyi et al., 2022) and housing (Arum et al., 2021; Samari & Groot, 2023; Tusting et al., 2015), among others. As such, the approach is deemed quite applicable and of immense value to the current study.

This systematic content analysis approach (Khirfan et al., 2020; Ogunbiyi et al., 2022; Seuring & Gold, 2012) helps in achieving the aim of the study by combining systematic review of literature and meta-analysis of the content of relevant extant studies. A database search for related previous studies published between the year 2020 and 2023 was conducted using Google Scholar, Science Direct, ResearchGate and Primo Search. These online databases were adopted in order to provide an equal chance for studies already done worldwide on the phenomena. In addition to being popular repositories of millions of academic articles, the four databases have adjusters and delimiters such as responsiveness to Boolean operators and range of years, among others, which are necessary for confirmation and validity checks. Moreover, they are open access tools that require no subscription or access fees before usage. Except for ResearchGate, the other three online databases were used to conduct systematic selection of studies in Khirfan et al. (2020) and Ogunbiyi et al. (2022). The key words of the current study were searched in the aforementioned online databases, after which the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) was deployed for assessment of the data.

The PRISMA model consists of a four-step process of "Identification, Screening, Eligibility, and Inclusion" (Moher et al., 2009) as applied to the literature; it is a more reasonable, reliable and replicable framework for selecting extant studies for systematic reviews (Nurick & Thatcher, 2021; Ogunbiyi et al., 2022; Ullah et al., 2018). The PRISMA model affords a more objective and painstaking course of action in the selection and evaluation of past studies for systematic literature reviews. The model's selection process helps to objectively include or exclude previous studies in line with the specific objectives and scope of present studies; on its part, the meta-analysis allows for a measure of statistical analysis in the systematic review (Nurick & Thatcher, 2021; Ullah et al., 2018). Moreover, the PRISMA model allows for a transparent and logical demonstration of how previous studies were selected for further in-depth content and/or thematic analysis (Nurick & Thatcher, 2021; Ogunbiyi et al., 2022).

As Figure 1 shows, in adopting the PRISMA framework, relevant keywords were searched on Google Scholar, Science Direct, ResearchGate and Primo Search. Entering the keyword "affordable housing" in the online databases generated a total of 464,991 items. Thereafter, the range of years was set to 2020-2023, thus limiting the resulting articles to 50,468. To filter and retain the most relevant studies, as well as to limit the resulting articles to a controllable sample size, Boolean operators were added to applicable words apart from "affordable housing", viz: "COVID-19" (results = 19,502), "housing supply" (results = 2,941), "housing delivery" (results = 1,261) and "empirical" (results = 1,143). After the above process of delimitation of resulting articles, a total of 92, 37 and 14 articles remained from Google Scholar, Science Direct and Primo Search respectively; as for ResearchGate, only the first 150 articles were selected from the remaining 1,000 articles from that database. Therefore, a total of 293 (92 + 37 + 14 + 150 = 293) articles were subjected to individual examination. The titles of the 293 selected articles were screened, with duplicates and unrelated articles excluded (n = 191). The abstracts and full texts of the remaining articles were screened and all irrelevant items were removed (n = 61). Because one article was not written in English and three were inaccessible online, they were also excluded. Thus, the remaining total of thirty-seven (37) articles were selected for meta-analysis in

deducing the impact of the COVID-19 pandemic on affordable housing and housing supply in the global economy. No sample size of articles was predetermined but the selected 37 articles were considered sufficient to significantly fulfil the aim of the study. Furthermore, studies have suggested that the selection of studies for systematic reviews usually range from 30 to 100 articles (Van-Wee & Banister, 2016; Paul et al., 2022). Besides, because systematic reviews can be rigorous and time-consuming (Khirfan et al., 2020; Ogunbiyi et al., 2023), the set time for this research could only allow for a sizeable number of articles to be selected for deep perusal as well as content and thematic analyses to be undertaken.

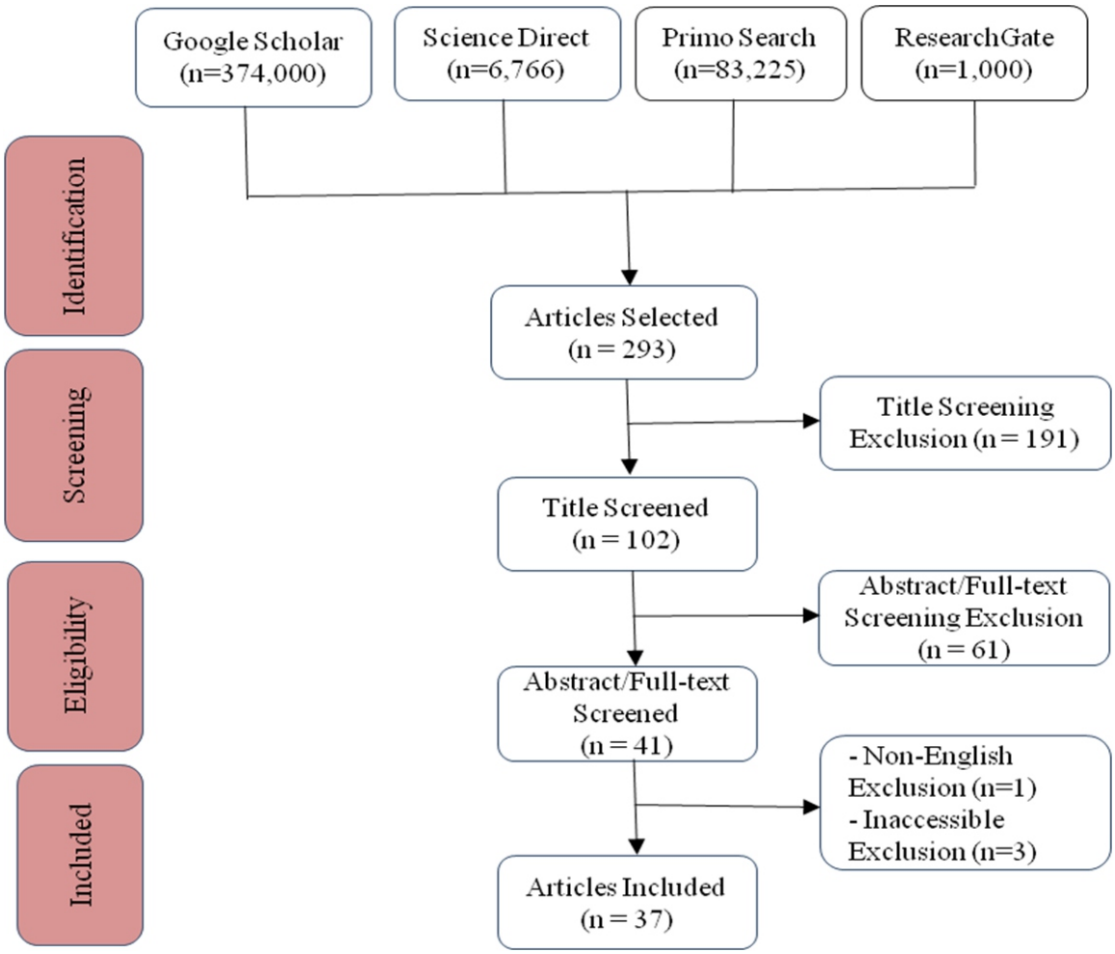


Figure 1: Resulting PRISMA model in the systematic selection of past relevant studies

3.0 Analysis and Findings

This section discusses the study's findings. The sub-sections hereunder are the results of bibliometric as well as content and thematic analyses of the qualitative, textual data gathered for this study – aided by the use of VOSviewer (Version 1.6.19) and Microsoft Excel (Version 2007).

3.1 Bibliometric Data Analysis on COVID-19, Affordable Housing and Housing Supply

In the preliminary analysis, peripheral findings from the studies were generated using VOSviewer. In the analysis of term co-occurrence map based on textual data (in the title and abstract fields but limiting the output to reasonable terms), the result is presented in Figure 2. The result suggests that, in a cross-country perspective, the impact of the COVID-19 pandemic on

housing, housing supply, housing affordability, the housing market and affordable housing depended largely on the measures undertaken by national governments in terms of movement restrictions, stay-at-home orders, palliatives and compensations to contain the health/safety challenges and to cushion the deleterious socioeconomic effects occasioned by the COVID-19 outbreak. This result agrees with the findings of previous studies on the mitigating influence of government interventions and containment measures during the pandemic (Cutcu et al., 2023; Færøvik, 2021; Kole, 2022; Veeroja et al., 2023; Zeng & Yi, 2022).

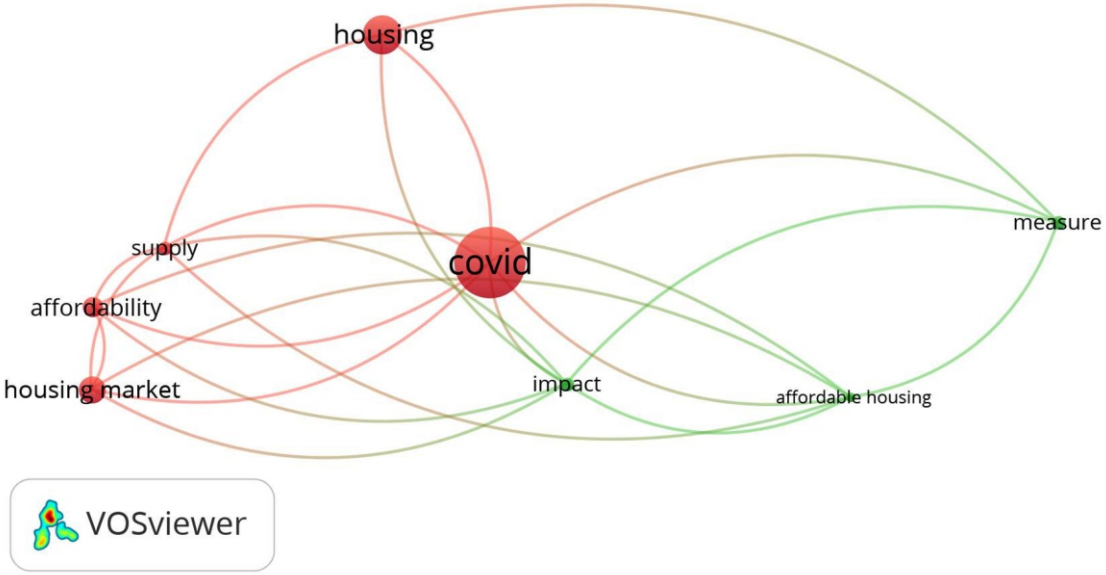


Figure 2: Co-occurrence map of key terms (title and abstract fields)

It should be noted that the above discussion is based on only the manifest bibliometric details of the selected studies; as such, it is necessary to undertake deeper content and thematic analyses of the selected articles in order to realise the study objectives.

3.2 Geographical Spread of Studies on the Impact of COVID-19 on Affordable Housing and Housing Supply

The first preset objective of this study is to appraise the geographical spread of publications on the impact of the COVID-19 pandemic on affordable housing and housing supply in various parts of the world. In the classification of past studies' geographies, the country and continental contexts were considered (see Table 1).

The results show that Europe (32.4%) had more studies about COVID-19 and housing than anywhere else. A further 24.3% of the studies focused on Asia, 21.6% on North America, 16.2% on Africa and 2.7% on each of South America and Oceania. This result is not surprising since Europe recorded the most infections (249,719,762 cases), Asia (218,950,005 cases) and North America (127,177,268 cases) (Worldometer, 2023). A total of 18.9% (the highest) of the studies emerged from the United States of America, where official records identified 107,481,826 cases and 1,169,682 fatalities (Worldometer, 2023), hence the interest of the country's researchers in the pandemic's impact on the housing sector. As for South America and Oceania, researchable gaps exist on the impact of the pandemic on affordable housing and housing supply. Most of the studies focused on the period 2020-2021 (67.6%) when the pandemic was most prevalent (WHO, 2022).

Table 1: Geographic Spreads of Research

Africa	Freq.	%	Europe	Freq.	%
Ghana	2	5.4%	25 European countries	1	2.7%
Nigeria	2	5.4%	Austria	1	2.7%
South Africa	2	5.4%	European Union	1	2.7%
Total	**6**	**16.2%**	Ireland	1	2.7%
			Italy	1	2.7%
Asia	**Freq.**	**%**	Norway	1	2.7%
China	2	5.4%	Poland	1	2.7%
Hong Kong	1	2.7%	Serbia	1	2.7%
Indonesia	1	2.7%	Spain (International)	1	2.7%
Philippines	1	2.7%	Sweden	2	5.4%
Turkey	2	5.4%	Wales (UK)	1	2.7%
Saudi Arabia	2	5.4%	**Total**	**12**	**32.4%**
Total	**9**	**24.3%**			
North America	**Freq.**	**%**	**South America**	**Freq.**	**%**
Canada	1	2.7%	Brazil	1	2.7%
USA	7	18.9%			
Total	**8**	**21.6%**			
Oceania	**Freq.**	**%**			
Australia	1	2.7%	**Grand Total**	**37**	**100.0%**
Year of Research	**Freq.**	**%**	**Research Design**	**Freq.**	**%**
2020	7	18.9%	Mixedmethod	1	2.7%
2021	18	48.6%	Empirical Qualitative	7	18.9%
2022	10	27.0%	Empirical Quantitative	19	51.4%
2023	2	5.4%	Review of Literature	10	27.0%
Total	**37**	**100%**	**Total**	**37**	**100%**

Source: Author's review (2023)

It is also worth noting that most of the studies were quantitative (51.4%). Considering the studies as a whole, empirical research made up 73% (comprising quantitative, qualitative and mixed-method approaches). Consequently, they constitute primary data as first-hand reports on the global impact of the COVID-19 pandemic on affordable housing and housing supply.

3.3 Issues Concerning COVID-19 Pandemic, Affordable Housing and Housing Supply

To realise the second objective of the study, this subsection examines the issues that were discussed in the selected publications regarding COVID-19, affordable housing and housing supply. The results of the content and thematic analyses are presented in Table 2. The top five (5) categorical issues were the Housing Market (24.3%), Government Policies (18.9%), Affordable Housing/Housing Affordability (16.2%), Housing Conditions (16.2%) and Housing Prices (8.1%).

Allen-Coghlan et al. (2020) assessed the likely impact of the pandemic on the Irish housing market and reported that it took a heavy toll on the Irish economy, worsening pre-existing

imbalances in the metrics of housing demand and supply. Wang (2022) examined the volatility of different spectrums of the housing market in Los Angeles in response to the pandemic. The study found an initial decrease in housing prices, as well as in demand and supply due to the pandemic; it was noted, however, that demand recovered the fastest alongside high- and low-priced markets in 2020. Gallent et al. (2022) explored changes in the housing market of communities in the Brecon Beacons National Park, Wales due to the outbreak. The authors found evidence of housing stress, that is, housing demand pressures were heightened by the COVID-19 pandemic coupled with constraints to development (supply) in rural communities. Romano (2021) studied the impact of the COVID-19 outbreak on short-term rentals in the environment of digital intermediation (Airbnb's) in selected cities of Italy. The study found that major parts of the cities appeared to have witnessed a reversal of the very significant growth in demand that was recorded in recent, previous years. Ahsan and Sadak (2021) conducted an exploration of urban densification, housing market, and the impacts of government policies during the COVID-19 crisis in Turkey. The study reported that the pandemic significantly impacted the housing market in Turkey: while urban densification had no measurable impact on housing sales, government interventions had a significantly positive impact on housing demand during the pandemic.

Table 2: Surrounding Issues of COVID-19 Pandemic, Affordable Housing and Housing Supply

S/N	Surrounding Issues	Context	Category	Freq.	%	Reference
1	Housing market in the midst of a pandemic	Ireland	Housing Market	9	24.30%	Allen-Coghlan et al. (2020)
	The volatility of housing market in response to the pandemic.	USA				Wang (2022)
	Changes in the housing market due to COVID-19 outbreak	Wales (UK)				Gallent et al. (2022)
	Impacts of COVID-19 outbreak on urban short-term rentals and digital intermediation	Italy				Romano (2021)
	Urban densification, housing market, and government policies during the COVID-19 crisis	Turkey				Ahsan & Sadak (2021)
	COVID-19 pandemic and cities' rental housing	Austrian				Kadi et al. (2020)
	COVID-19 crisis and the housing sector	Turkey				Cutcu et al. (2023)
	COVID-19 crisis and impacts on housing market at the epicenter (Wuhan)	China				Zeng & Yi (2022)
	Situation of housing market due to COVID-19 outbreak	Norway				Færøvik (2021)
2	Vision 2030 for affordable housing finance and the COVID-19 impacts	Saudi Arabia	Government Policies	7	18.90%	Alharbi (2022)
	COVID-19 pandemic impacts on housing policies	Brazil				Vernice & Silva (2023)
	COVID-19 crisis, control regulations of government, and inequalities in housing and education	South Africa				Tembo & Chidede (2022)
	Housing challenges and policy recommendations	USA				Immergluck (2021)
	Housing vouchers from government and overcrowding in homes	USA				Kole (2022)
	Government's housing policy and interventions in response to COVID-19 crisis	Indonesia				Sururi (2022)
	Survival guidelines and workable solutions housing sector during Covid19 crisis	Philippines				Tumamao-Guittap (2021)

3	The direction of affordable housing and the effects of COVID-19	USA	Affordable Housing/	6	16.20%	Barkey (2022)
	COVID-19 pandemic and housing affordability	Canada	Housing Affordability			Ucoglu et al. (2021)
	Housing deprivation across European countries during COVID-19 pandemic	25 European Countries				Ayala et al. (2022)
	Housing challenges among the informal sector during the COVID-19 pandemic	Nigeria				Yoade et al. (2023)
	COVID-19 pandemic and urban housing delivery and affordability	Nigeria				Musa et al. (2020)
	Housing insecurity challenges of households during the COVID-19 crisis	South Africa				Durga (2023)
4	Housing-related realities doing the pandemic	Ghana	Housing Conditions	6	16.20%	Agyekum (2022)
	Housing conditions, pandemic spread, and associated mortality	USA				Ahmad et al. (2020)
	Housing conditions and the COVID-19 pandemic	Serbia				Zivkovic & Stamenkovic (2021)
	The global pandemic and housing characteristics	Sweden				Ismail et al. (2022)
	Private renters, shared housing and mental well-being in a pandemic-era	Australia				Veeroja et al. (2023)
	Housing and social distancing practices in a pandemic	Ghana				Morgan & Ibrahim (2021)
5	Urban housing prices in the midst of a pandemic	China	Housing Prices	3	8.10%	Liu & Tang (2021)
	Housing prices during the COVID-19 outbreak	Poland				Belej (2021)
	Pandemic impacts on housing price	Hong Kong				Liu (2022)
6	Unequal impacts of the pandemic and indoor smoking in public housing	USA	Social housing	2	5.40%	Gehlert et al. (2023)
	European social housing sector confronting the challenges of COVID-19	European Union				Brunet (2020)
7	Homeownership finance by private-sector employees in a pandemic	Saudi Arabia	Home Ownership Finance	1	2.70%	Alharbi (2023)
8	Affordable housing production and a regional governance approach	USA	Housing Administrati	1	2.70%	Tasan-Kok et al. (2022)
9	Housing distribution for the elderly and the spread of COVID-19	Sweden	Elderly Housing	1	2.70%	Kulander & Wilhelmsson (2021)
10	COVID-19 pandemic and housing design	Spain	Housing Design	1	2.70%	De Jorge-Huertas & De Jorge-Moreno (2023)
			Total	**37**	**100%**	

Source: Author's review (2023)

On their part, Kadi et al. (2020) sought to understand the impact of the COVID-19 pandemic on rental housing in four Austrian cities and found that considerably in line with speculations at the onset of the pandemic, short-term rentals were returned to regular rental housing, thereby improving the rental housing supply. Cutcu et al. (2023) also explored the impact of the pandemic on the Turkish housing sector and found a long-run bidirectional causal relationship among the examined variables of housing loans and exchange rates as well as the number of new deaths and new cases of the infection. Færøvik (2021) examined the situation of the housing market in Oslo, Norway in relation to the outbreak and found a sudden decrease in housing prices

and sales in the wake of the pandemic, followed by unexpected substantial increases in the two indicators about the housing market. The study by Zeng and Yi (2022) had the general objective of determining the impact of COVID-19 on the housing market in Wuhan, China. The study reported a negative impact that lasted only for a few weeks before the housing situation returned to its prior state. This may be traceable to the Chinese government's stance against speculative housing possessions, which prevented panic and speculative buying.

Considering government policies as a thematic focus, Alharbi (2022) set out to examine the impact of COVID-19 on Saudi Arabia's Vision 2030 for affordable housing finance. The researcher found that the pandemic significantly threatened the realisation of the country's Vision 2030 for affordable housing finance. Vernice and Silva (2023) focused on how the pandemic impacted existing housing policies in Brazil, especially as they relate to evictions and removals. Findings from the study suggest that the pandemic accentuated the structural faults inherent in prevailing housing policies in Brazil. On their part, Tembo and Chidede (2022) examined the effects of the pandemic and the control regulations of government on inequalities in housing and education in South Africa. The authors opined that, considering adequate housing and access to education, the COVID-19 period intensified existing socioeconomic inequalities in South Africa. Immergluck (2021) identified the existing housing challenges and proffered effective policy recommendations to the USA government. The author observed that, with the decline in homeownership and steep rent increases among the socioeconomically disadvantaged, interventions in housing policy became heightened during the COVID-19 pandemic.

Kole (2022) analysed the effectiveness of housing vouchers from the United States' federal government in limiting overcrowding in homes. According to the author, housing vouchers reduced the incidence of overcrowding in homes and enabled economically challenged households to obtain more suitable housing. In the same vein, Sururi (2022) appraised the effectiveness of government's housing policy and interventions in response to challenges posed by the COVID-19 crisis in Indonesia. The study reported that, while there was essential integration among the indicators of housing policy capacity in responding to the pandemic in Indonesia, the weakness of the housing system capacity (delivery arrangements) was affected by financial resources and political capacities. Tumamao-Guittap (2021) also presented survival guidelines and workable solutions for the Filipino housing sector in the wake of the COVID-19 crisis. The author stated that, prior to the COVID-19 outbreak and stay-at-home orders, a large segment of the Filipino population already lacked decent and affordable housing and their situation merely worsened because of the pandemic.

In examining issues of affordable housing/housing affordability, Barkey (2022) presented an overview of the direction of affordable housing coupled with the effect of the pandemic. The author observed that the prospects of housing are significantly determined by policies and regulations and suggested a need for more studies and efforts to understand the particular impact of local policies on affordability and housing supply. Ucoglu et al. (2021) also presented an analysis of the impact of the pandemic on housing affordability in the Greater Toronto Area. According to the researchers, the principal challenge was the insufficiency of housing options in the region, which renders the city vulnerable at critical times. For Ayala et al. (2022), the concern was the extent of housing deprivation across European countries during the pandemic. The study reported that housing deprivation, which may be a significant factor in the spread of infections, was higher among households in eastern European nations during the pandemic.

Furthermore, Yoade et al. (2023) presented an overview of housing challenges especially in the informal sector during the pandemic in Nigeria. They found that the pandemic had more damaging impacts on marginalised groups in terms of poor housing and other socioeconomic indicators. For Musa et al. (2020), the focus of research was determining the impact of the

pandemic on urban housing delivery and affordability in Nigeria. The authors found that the following factors contributed to the impact of the COVID-19 outbreak on urban housing delivery and affordability: the increased demand and supply of virtual (ICT) technology, stay-at-home orders, loss of employment, government restrictions, and social distancing. Similarly, Dunga (2023) examined the housing insecurity challenges of South African households during the COVID-19 crisis. The study found that only about 2.6% of the sampled households had secure housing during the pandemic.

In the categorical research prominence of Housing Conditions, Agyekum (2022) studied the perceptions of students with respect to housing-related realities doing the pandemic and lockdown in Ghana. Findings of the study suggest that a set of geographic and socioeconomic factors affect learning from home and need more detailed policy considerations for adult student housing. Correspondingly, Ahmad et al. (2020) assessed the correlation between poor housing conditions, pandemic spread and associated mortality in the United States. The study reported that for households with poor housing condition, every 5% headcount increase was associated with a 50% and a 42% higher risk of COVID-19 incidence and mortality respectively. Zivkovic and Stamenkovic (2021) further examined the relationship between housing conditions and the COVID-19 pandemic in Serbia. The study asserted that the state of housing and the COVID-19 health crisis presented a peculiar and unprecedented circumstance for a review of existing housing models and a redefinition of housing sustainability.

Similarly, Ismail et al. (2022) analysed the correlation between the pandemic and housing characteristics in Sweden. The study found that housing characteristics were significant variables in explaining the spatial spread of COVID-19. Veeroja et al. (2023) also analysed the situation of private renters with respect to their shared housing and mental well-being during the pandemic in Australia. The authors reported that, except for participants who had to work from home, the more the number of persons in households living in shared housing (private renters) during the pandemic, the fewer the reports of worry, isolation, loneliness and anxiety when compared with households with fewer dwellers. For Morgan and Ibrahim (2021), the focus was on the impact of housing on the social distancing practices of vulnerable populations in Ghana during the pandemic. Their study found that poor and overcrowded housing amplifies the susceptibility of residents to communicable diseases such as COVID-19.

Housing Prices was the thematic target of a good number of previous studies. Thus, Liu and Tang (2021) determined the response of housing prices to the COVID-19 pandemic in Chinese cities. The study reported that, despite government intervention in mitigating the volatility of the housing sector, localities with confirmed records of COVID-19 infections had a reduction in average housing prices at an approximate rate of 1.3%. In the same vein, Belej (2021) analysed the trend of housing prices in selected cities during the COVID-19 outbreak in Poland. Belej found that, although the COVID-19 crisis created significant economic shocks on the demand and supply sides of the market, a significant trend of growth was recorded in the Polish housing market during the period. Liu (2022) also analysed the impacts of the pandemic on housing prices in Hong Kong. The researcher found that, in comparison with the pre-existing housing situation, the pandemic period occasioned a reduction in housing prices in Hong Kong.

Other considerations in previous studies were Social Housing, Home Ownership Finance, Housing Administration, Elderly Housing, and Housing Designs. Gehlert et al. (2023) explored the unequal impacts of the pandemic by considering indoor smoking in public housing during the lockdown. It was found that stay-at-home orders worsened the plight of public housing residents, as they were exposed to increased second-hand smoke, which was detrimental to their health. For Brunet (2020) the research concern was the efforts of the European social housing sector in confronting the challenges posed by the outbreak. The study reported that, prior to the outbreak

of the pandemic, the European Union and national governments did not effectively address the crises of affordability and shortage in social housing. Since the pandemic, however, there has been a reconsideration of the relevant social policies.

Alharbi (2023) aimed to determine COVID-19 impacts on homeownership finance by private-sector employees in Saudi Arabia. The researcher found that income irregularities resulting from COVID-19 challenges led to mortgage repayment defaults. Tasan-Kok et al. (2022) examined the prevailing affordable housing production in Amsterdam while proposing a regional governance approach. The authors reported increased but scattered regulatory processes governing housing delivery and access in the metropolitan areas of Amsterdam. In their own study Kulander and Wilhelmsson (2021) analysed how the distribution of housing for the elderly affected the spread of COVID-19 in Sweden. They found no correlation, whether surplus or deficit, in the supply of housing for the elderly and the spread of the COVID-19 crisis. For De Jorge-Huertas and De Jorge-Moreno (2023) it was necessary to explore the probable connections in studies on the COVID-19 pandemic and housing design. According to the authors, examining the issues of housing alongside the outbreak of the pandemic led to a complex system that requires interdisciplinary considerations.

Based on the issues examined in the studies above, research gaps could be observed. For example, there is a need to examine how the pandemic may affect attainment of the Sustainable Development Goals in different countries, especially as it relates to affordable housing for all. Again, more research into the impact of the pandemic on housing for the elderly may enrich the existing literature because of the peculiar vulnerability of the elderly during the pandemic.

3.4 Deduced Global Impacts of the COVID-19 Pandemic on Affordable Housing and Housing Supply

This subsection addresses the third objective of the study, that is to determine the combined impacts of the COVID-19 pandemic on affordable housing and housing supply in a global perspective. The results of the content and thematic analyses are presented in Table 3 and depicted in Figure 3.

Table 3: Impacts of COVID-19 Pandemic on Affordable Housing and Housing Supply

S/N	Impacts of COVID-19	Context	Category	Freq.	%	Sources
1	Fall in income leading to reduction in housing demand	Ireland	Housing Demand, Supply and Price	17	30.9%	Allen-Coghlan et al. (2020)
	Increase in shortage of housing	Saudi Arabia				Alharbi (2022)
	Slight reduction in housing prices	China				Liu & Tang (2021)
	Surge in housing demand and increased pressure on inadequate supply	USA				Barkey (2022)
	Increased housing prices and decrease in demand for office space	USA				Barkey (2022)
	Initial drastic reduction in housing price, demand, and supply	USA				Wang (2022)
	Increased housing demand, constrained supply and increased housing price	Wales (UK)				Gallent et al. (2022)
	Reduction in housing demand	Italy				Romano (2021)
	Increase in housing void and vacancy	Italy				Romano (2021)
	No indication of significant decline in housing prices	Poland				Belej (2021)
	Increased housing investments in peri-urban areas	USA				Tasan-Kok et al. (2022)
	Short-term rentals were returned to regular rental housing market but high rents remained	Austria				Kadi et al. (2020)
	Reduction in house sales (affecting both demand and supply)	Indonesia				Sururi (2022)
	Work-from-home results in increase in housing demand, inadequate supply and price increase	Turkey				Cutcu et al. (2023)
	Volume and areas of transactions affected negatively; housing prices slightly affected	China				Zeng & Yi (2022)
	Drop in housing demand, housing supply activities, and housing prices	Hong Kong				Liu (2022)
	Housing demand, sales and prices increased even more than the pre-pandemic period	Norway				Færøvik (2021)
2	Evidenced the huge gaps in social-economic classes	South Africa	Socioeconomic Gaps	10	18.2%	Tembo & Chidede (2022)
	Worsened housing affordability crisis	Canada				Ucoglu et al. (2021)
	Evidenced disproportionate vulnerability of different socio-economic class	USA				Gehlert et al. (2023)

	Rent payment incapability and threats of eviction	USA				Immergluck (2021)
	More attention to housing affordability and overcrowding	USA				Kole (2022)
	Increased housing unaffordability, housing insecurity, space requirements	Nigeria				Musa et al. (2020)
	Prominence of housing affordability issues	European Union				Brunet (2020)
	Affected housing availability and overcrowding	Sweden				Ismail et al. (2022)
	Prominence of households' housing insecurity	South Africa				Dunga (2023)
	Socioeconomically disadvantaged groups suffered more due to unaffordable housing	Turkey				Ahsan & Sadak (2021)
3	Higher costs of housing construction	Saudi Arabia	Housing Construction Activities	8	14.5%	Alharbi (2022)
	Increased defaults in housing construction completion rate	Ireland				Allen-Coghlan et al. (2020)
	Affected investment and development of housing	Nigeria				Musa et al. (2020)
	Hindered housing delivery/construction works	European Union				Brunet (2020)
	Delays in handing-over housing developments	Indonesia				Sururi (2022)
	Lags in housing development approvals	Indonesia				Sururi (2022)
	Disruptions in housing development activities and supply chain	Turkey				Cutcu et al. (2023)
	Hindered real estate businesses and construction sites	China				Zeng & Yi (2022)
4	Higher eviction rate and trappings of homelessness	Saudi Arabia	Informal Sector Housing Conditions	7	12.7%	Alharbi (2022)
	Prominence of poor condition of houses and neighbourhoods of the less privileged	Ghana				Agyekum (2022)
	Prominence of poor housing of poor households	USA				Ahmad et al. (2020)
	Exacerbated housing crisis: deficient living conditions and overcrowded housing units	Serbia				Zivkovic & Stamenkovic (2021)
	Removals and evictions among the lowest-income groups	Brazil				Vernice & Silva (2023)
	Informal sector's poor housing and overcrowded living conditions	Nigeria				Yoade et al. (2023)

	Worsened plights of urban poor communities - overcrowded shanties and congested slums	Philippines				Tumamao-Guittap (2021)
5	Worsened inequitable housing policies affecting vulnerable groups	Saudi Arabia	Housing Policies of Governments	4	7.3%	Alharbi (2023)
	Inefficient metrics of affordable housing, financing and supply	Ghana				Morgan & Ibrahim (2021)
	Affordable housing policies lack inclusion of socially vulnerable population	Brazil				Vernice & Silva (2023)
	Government intervening policies mitigated the effects on housing market	Turkey				Ahsan & Sadak (2021)
6	Income irregularities and mortgage repayment defaults	Saudi Arabia	Mortgage Repayment Defaults	4	7.3%	Alharbi (2023)
	Increased credit constraints	Ireland				Allen-Coghlan et al. (2020)
	Defaults in mortgage repayments	Italy				Romano (2021)
	Households' inability to repay housing loans	Indonesia				Sururi (2022)
7	COVID-19 per housing consideration leads to multidimensional issues	Spain (International)	Multidimensional Issues	3	5.5%	De Jorge-Huertas & De Jorge-Moreno (2023)
	Inadequate housing conditions, leading to economic stress and mental illness	25 European countries				Ayala et al. (2022)
	Household size became a protective mechanism for well-being under affordable housing	Australia (Oceania)				Veeroja et al. (2023)
8	Increase in digital nomads and migration	Wales (UK)	Increased Digital Nomads	1	1.8%	Gallent et al. (2022)
9	Prominence of underinvestment in elderly housing	Sweden	Elderly Housing Supply	1	1.8%	Kulander & Wilhelmsson (2021)
			Total	**55**	**100%**	

Source: Author's review (2023)

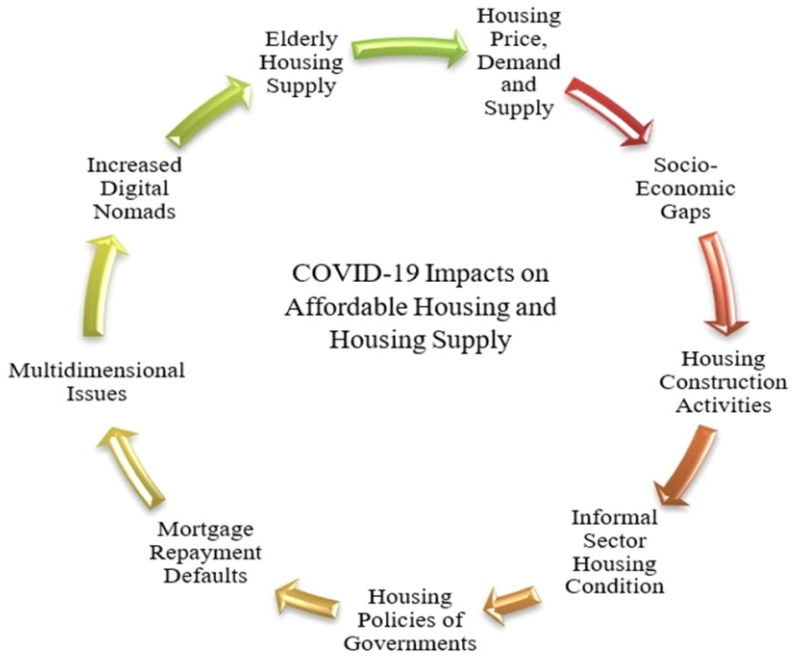


Figure 3: The Cycle of Impacts of COVID-19 on Affordable Housing and Housing Supply

Source: Author's review (2023)

1. Housing Demand, Supply and Price: The thematic category of Housing Demand, Supply and Price was the most reported in the examined studies. No less than 30.9% of the studies indicated that the pandemic impacted on housing demand, supply and housing price. Demand, level of supply and price are critical to affordable housing. However, the impacts varied significantly across countries, with the differences being due to unique country conditions, local responses to government restrictions/containment measures, and types as well as extent of effectiveness of socioeconomic mitigating interventions of national governments.

Allen-Coghlan et al. (2020) noted that, owing to the pandemic, economic activities and incomes would diminish with resultant reduction in housing demand, predicting a shortfall in supply in Ireland whenever demand picked up. The authors also predicted the long-term (speculative) effects of structural changes in the dynamics of housing demand and supply as more people increasingly work from home. Similarly, Alharbi (2022) found that the COVID-19 outbreak intensified the shortage of housing in Saudi Arabia, as housing supply activities were significantly hindered. On their part, Liu and Tang (2021) submitted that heterogeneity of response was observed in reductions in average rentals, housing prices and level of transactions between ordinary communities and the upscale cities in China. Barkey (2022) found that, at the end of the two-month national economic stagnation due to the pandemic in the USA in 2020, there was a heavy surge in residential demand, worsening current levels of inadequate supply and accelerating housing prices. According to the researcher, a number of factors were responsible for these impacts. One, the housing sector adapted to social distancing as video showings and e-closings led to a wider market pool of effective demand. Two, there was a change in perceptions about city densities as household needs for more space increased. Three, the fear of contracting the virus and the suspicion that private housing might become inadequate, prevented new listings by sellers. Four, the work-from-home model led to a decrease in demand for office space and a corresponding increase in demand for housing alongside an increase in housing prices.

Equally, Wang (2022) found that, although both high- and low-priced housing markets experienced drastic reduction in prices as well as demand and supply due to COVID-19 in 2020 (with demand outpacing in recovery), heterogeneity exploration showed divergent impacts in Los Angeles. According to the author, the lower-priced markets accounted for the larger share of reduction in price and demand, while the high-priced markets had the higher surge in demand, supply and price, thus justifying the need for financial subsides among households in lower-priced markets with respect to rent and mortgage payments. Furthermore, Gallent et al. (2022) found that, as a result of increased housing demand and constrained supply in the Brecon Beacons National Park area of Wales, housing prices increased in the rural markets and near-urban centres in 2020 and 2021. The study by Romano (2021) found that the pattern of significant growth in demand that was initially recorded across major parts of selected cities in Italy seemed to have been eroded by the COVID-19 crisis, with attendant void, loss of income and rise in debt.

Contrastingly, Bełej (2021) found that, contrary to initial predictions about the housing market and prices (in the direction of housing affordability), there was no significant decline in housing prices in selected cities of Poland. However, Tasan-Kok et al. (2022) reported a substantial increase in housing investments in the surrounding metropolitan areas, outside the core urban areas of Amsterdam, owing to affordability considerations. Kadi et al. (2020) observed that, although results indicated the reverting of short-term rentals to regular rental housing across studied cities in Austria, pre-existing high rents were unaffected. The authors further noted that the probability that the return of short-term (tourism) rentals to regular rental housing would subsist in the long run proves largely uncertain (which could have increased the overall rental housing supply).

Sururi (2022) found that COVID-19 had a critical impact on housing in Indonesia, as there was a

reduction in house sales (affecting both demand and supply sides of the market). According to Cutcu et al. (2023), the work-from-home approach resulted in an increase in housing demand, inadequate supply and price increase in Turkey. Zeng and Yi (2022) also reported that volume of housing transactions and areas of transactions were largely affected negatively but housing prices were only slightly affected in Wuhan, China. Liu (2022) found that the COVID-19 outbreak negatively affected socioeconomic activities, leading to a drop in housing demand as well as housing supply activities and, ultimately, housing prices in Hong Kong. Færøvik (2021) demonstrated that housing demand, sales and prices increased even more than during the pre-pandemic period. The author ascribed these impacts to lockdowns and supply shortages, slowdowns in other economic sectors, government's compensatory policies, lowered interest rates, and resultant surplus income.

2. Socioeconomic Gaps: The theme of Socioeconomic Gaps was the next significant among the impacts of the COVID-19 crisis in a global perspective (at 18.2% of reported impacts). Socio-economic gaps determine whether or not disparate households could obtain adequate and affordable housing. Tembo and Chidede (2022) found that the impact of the COVID-19 outbreak was not uniform across different socioeconomic classes. The authors noted that government regulations, stay-at-home orders and the plight of inadequate housing among the poor and the homeless only made them more vulnerable to the pandemic in South Africa. Similarly, Ucoglu et al. (2021) submitted that the COVID-19 outbreak worsened the prevailing housing affordability crisis in the Greater Toronto Area. Also, Gehlert et al. (2023) reported that the COVID-19 lockdown evidenced the disproportionate vulnerability of different socioeconomic classes owing to inadequate housing for the disadvantaged, who live in public housing in the USA. Immergluck (2021) corroborated the finding by observing that house rent-paying, low-income earners were mostly and particularly affected during the COVID-19 crisis. The study also found that the major issues faced by such people were rent payment incapacity and threats of eviction.

Similarly, Kole (2022) reported that in the USA, with social-distancing-guidelines and stay-at-home orders, the COVID-19 outbreak brought more attention to housing affordability and overcrowding. Musa et al. (2020) added that the COVID-19 pandemic significantly affected housing affordability, housing security and household's space requirements in Nigeria. In addition, Brunet (2020) reported that the COVID-19 period made housing affordability issues more critical in the European Union. On their part, Ismail et al. (2022) showed that the key features of housing that were found to be related to the spread of COVID-19 in Sweden included housing availability, quality and overcrowding. Moreover, Dunga (2023) found that class of population, crowding, household's income, gender and materials for house construction were the key determinants of households' housing insecurity during the pandemic in South Africa. Again, Ahsan and Sadak (2021) showed that socioeconomically disadvantaged groups suffered more during the pandemic-era in Turkey, pointing to the need for more directed government intervention in affordable housing for the poor.

3. Housing Construction Activities: Third in the thematic rank of the impacts of the pandemic are the effects on Housing Construction Activities, which took about 14.5% of reported impacts. Hinderances to housing construction activities could only mean that affordable housing provision and available supply of housing would be negatively affected. Alharbi (2022) submitted that the COVID-19 crisis brought about higher costs to housing construction in Saudi Arabia. Musa et al. (2020) corroborated this finding by showing that the crisis significantly affected investment and development of housing and other real-estate assets in Nigeria. Also, Allen-Coghlan et al. (2020) averred that the COVID-19 outbreak would increase defaults in housing construction completion rates in Ireland, predicting a subsequent supply shortfall. As Brunet (2020) found, the COVID-19 crisis hindered housing delivery/construction works in the European Union.

Sururi (2022) found that the outbreak of COVID-19 had critical impacts on housing in Indonesia, as it led to delays in handing over housing developments, in addition to delays in housing development approvals. Cutcu et al. (2023) claimed that government's containment restrictions during the pandemic in Turkey led to disruptions in housing development activities, with the supply chain affected. Finally, Zeng and Yi (2022) noted that movement restrictions and quarantine measures hindered real-estate businesses and construction sites, thus affecting the rate of housing transactions and supply in China.

4. Informal Sector Housing Conditions: At 12.7%, the analysed studies suggested that the informal sector was particularly affected negatively during the pandemic. Government policies on affordable housing and housing supply hardly capture the informal sector and the lowest-income households. As Alharbi (2022) found, the COVID-19 outbreak occasioned higher eviction rates and trappings of homelessness among the urban poor in Saudi Arabia. Agyekum (2022) also observed that poor housing and neighbourhood conditions affected well-being and home learning, in contrast to the situation in more attractive (i.e. expensive) areas in Ghana. Further, Ahmad et al. (2020) noted that, as evidenced by the pandemic period, it is necessary to design mitigating policies, especially those directed at poor households in the USA.

Additionally, Zivkovic and Stamenkovic (2021) found that the COVID-19 pandemic exacerbated the housing crisis in Serbia, with attendant deficient living conditions characterised by dysfunctional and overcrowded housing units, especially among the socioeconomically disadvantaged. Vernice and Silva (2023) reported that, in the attempts to curtail the outbreak in Brazil, the COVID-19 period witnessed removals and evictions among the lowest-earning groups, putting them in even more precarious conditions. The authors noted the importance of affordable housing policies that provide a wider net of inclusion for the socially vulnerable population and the urban peripheral residents. Yoade et al. (2023) evaluated the informal sector as notably characterised by poor housing and overcrowded living conditions that worsened their plight during the lockdown in Nigeria. Tumamao-Guittap (2021) also reported that the stay-at-home orders and containment restrictions worsened the plight of the urban poor communities in the Philippines, who live in overcrowded shanties and congested slums. In particular, the work-from-home approach was not a workable solution to their "street economy" and livelihood.

5. Housing Policies of Governments: The limitations, ineffectiveness, inadequacy and inequalities of Housing Policies of Governments became more pronounced during the pandemic (at 7.3% of suggested COVID-19 impacts). Morgan and Ibrahim (2021) reported that the pandemic forced a rethinking of the metrics of affordable housing (including financing and supply) and their practical implications in Ghana. In Saudi Arabia, Alharbi (2023) argued that equitable housing policies need to take cognisance of the most vulnerable groups in housing-affected situations. Accordingly, Vernice and Silva (2023) observed that, as evidenced by housing situations during the pandemic, affordable housing policies need to provide a wider net of inclusion for the socially vulnerable population and the urban peripheral residents in Brazil. However, Ahsan and Sadak (2021) submitted that while an initial decline in housing demand and sales was recorded owing to COVID-19 restrictions, a major increase in housing demand in Turkey resulted from government interventions in the forms of online land registry processes, reduction of public banks' interest rates and provision of stimulus packages, including house rent. The authors also noted that the use of electronic money, increased online transactions while innovative virtual technologies became more prominent among property market participants.

6. Mortgage Repayment Defaults: The examined reports of previous studies also suggested that, as a result of the constraints to household earnings and disposable incomes during the pandemic, there were significant Mortgage Repayment Defaults (at 7.3% impacts of the COVID-19 crisis). Clearly, mortgage repayment is pivotal to affordable housing reinvestment

ventures. The implication of large-scale inability of mortgagors to repay loans on their housing could be a major detriment to the availability of funds for more housing provision. Alharbi (2023) reported that private-sector employees in Saudi Arabia found it difficult to meet their mortgage repayment obligations because of the pandemic. The author suggested that future equitable housing policies should consider the needs of the most vulnerable groups in terms of housing-affected hardship. Allen-Coghlan et al. (2020) asserted that, owing to disruptions in economic activities and incomes during the COVID-19 crisis, there were increased credit constraints among examined respondents in Ireland. Romano (2021) also observed that, contrary to recent increase in housing demand across major parts of examined cities in Italy, the COVID-19 outbreak led to defaults in mortgage repayments, thus hindering the supply side of housing. Adding to the reports, Sururi (2022) reported that the COVID-19 crisis led to households' inability to repay housing loans in Indonesia.

7. Multidimensional Issues: Seventh in the order of categorical impacts of the COVID-19 pandemic on affordable housing and housing supply are Multidimensional Issues, which accounted for 5.5% of impacts. The coronavirus affected all spheres of life and all sectors of the world economy, especially education, health and finance. In the interwoven dependence of the different spectrums of human existence, it would be expected that households' access to affordable housing and housing supply would be affected by events in other aspects of life. De Jorge-Huertas and De Jorge-Moreno (2023) showed that the connections between housing and COVID-19 are multidimensional, cutting across environmental, medical, architectural and other related aspects in meeting the needs of households as a result of the pandemic. Ayala et al. (2022) found that inadequate housing conditions worsened during the lockdown period and led to economic stress and mental illness, thus necessitating timely government interventions to promote suitable housing in the studied European countries. Veeroja et al. (2023) confirmed this finding, affirming that during the lockdown restrictions in Australia feelings of worry, isolation, anxiety and loneliness were less reported among households who considered their housing to be "very affordable" or "affordable" and self-opined it to be "Excellent" or in "Good condition". The study highlights the importance of policy measures that could support the coping and recovery mechanisms of households during a crisis.

8. Increased Digital Nomads: 'Digital nomads', a term to explain migration by people who are concerned with cost of data and availability of Internet connectivity, became more common during the pandemic. Increased digital nomads accounted for 1.8% of reported impacts of the pandemic on affordable housing and housing supply. Digital nomads could affect affordable housing supply by relocating to areas that support the work-from-home practice in terms of better internet connections. The study by Gallent et al. (2022) in Wales (UK) found that the COVID-19 crisis reinforced the increasing trend of digital nomads and migration stirred by flexible-working arrangements.

9. Elderly Housing Supply: Also, at 1.8% of reported impacts, affordable housing supply for the elderly was significantly affected during the pandemic. The elderly (and the infirm) were commonly reported to be vulnerable to the coronavirus infection; as such, their housing conditions attracted special attention during the pandemic. Kulander and Wilhelmsson (2021) reported that Sweden was forced to pay more attention to the challenges of underinvestment in elderly housing during the pandemic, given the sub-optimal health of the elderly, their need for long-term-care and their associated vulnerability.

In the light of the foregoing reviews, a number of research gaps are apparent. One, more studies are needed on the impact of the COVID-19 pandemic on the housing plight of the elderly, considering their susceptibility to the virus. Two, future studies may consider areas where government's restrictive and containment measures reflected a 'human-face' by recognising the

precarious housing conditions of the urban poor and other households in congested slums. Three, multidisciplinary and interdisciplinary studies on the impacts of the pandemic on housing could enrich existing understanding of the subject matter. Four, more studies may consider the extent of the effects of digital nomads on the housing market during the pandemic era as they sought suitable housing in which to work from home. Finally, the present study design may be advanced with more empirical approaches in different country and continental settings.

4.0 Conclusion, Policy Recommendations and Areas for Further Studies

This study aimed to provide a global perspective on the impacts of the COVID-19 crisis on affordable housing and housing supply. The study undertook a critical exploration and systematic appraisal of the literature to achieve the aim of the study. The PRISMA model was adopted in the systematic selection of past studies, with bibliometric, content and thematic analyses being undertaken to explore the reports obtained from extant studies. Generally, the study found that "the old problem is the new problem", that is, COVID-19 only complicated the situation. The unpalatable global conditions of unaffordable housing and inadequate housing supply were compounded by a combination of health, social, pricing and market problems during the pandemic era.

More specifically, categorical findings of the study revealed that the pandemic affected affordable housing and housing supply through the following: housing prices, demand and supply; socioeconomic gaps; housing construction activities; informal sector housing conditions; housing policies of governments; mortgage repayment defaults; multidimensional issues; increased digital nomads; and elderly housing supply. The reported impacts may serve future reference purposes in periods of natural disruptions and may guide present post-pandemic recovery studies and policy implementations.

Resulting from the findings of this study, critical policy recommendations are now highlighted that may serve as safeguard measures during national crises and as post-crises recovery measures that affect affordable housing supply. Thus, the study recommend as follows: more effective government interventions in the provision, regulation and implementation of affordable housing in partnership with the private sector; increased investment in social and public housing that provides a wider net for the inclusion of the poorest households as well as the homeless and slum dwellers; subsidy, tax rebates and other incentives should be provided to proven private developers whose business target is affordable housing supply; facilitation of cheaper, more effective and efficient mortgage arrangements (and repayment plans) for low-income earners; and implementation of a housing policy framework that recognises socioeconomic gaps in the society (to the advantage of the less privileged).

A limitation of the study is that it is a general review paper; therefore, inference and generalisations are limited, although the arguments in the study have been presented in as objective and clear a manner as possible to delineate applicability. Owing to the inherent limitations of the study and the research gaps that ensued from the analysis of the systematically selected articles, the following areas for further studies are suggested: more studies on the impact of the pandemic on affordable housing and housing supply in more countries in South America, Oceania, and Africa; empirical and theoretical studies on the impact of the COVID-19 crisis on the attainment (or non-attainment) of the Sustainable Development Goals (including the pre- and post-pandemic periods) in the countries, especially as they relate to affordable housing for all; more research into the impact of the pandemic on housing for the elderly; more studies on government's pandemic-containment measures that affected (or recognised) the housing conditions of the urban poor and the informal sector; multidisciplinary and interdisciplinary studies of the impact of the pandemic on housing delivery; extent and implications of digital nomads on the housing market during the pandemic era (seeking housing in which to work from home); more empirical studies on the impact of COVID-

19 on affordable housing and housing supply in different country and continental settings; more studies on the impact of COVID-19 on affordable housing and housing supply with a larger sample size using alternative bibliometric and altmetric approaches.

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References

Agyekum, B. (2022). Adult student perspectives toward housing during COVID-19. *Wellbeing, Space and Society, 3,* 100086. https://doi.org/10.1016/j.wss.2022.100086.

Ahmad, K., Erqou, S., Shah, N., Nazir, U., Morrison, A. R., Choudhary, G. & Wu, W. (2020). Association of poor housing conditions with COVID-19 incidence and mortality across US counties. *PLoS ONE 15*(11): e0241327. https://doi.org/10.1371/journal.pone.0241327.

Ahsan, M., & Sadak, C. (2021). Exploring housing market and urban densification during COVID-19 in Turkey. *Journal of Urban Management*. https://doi.org/10.1016/j.jum.2021.06.002.

Alharbi, R. K. (2022). An appraisal of the early impact of COVID-19 on affordable housing finance in Saudi Arabia's Vision 2030. *International Journal of Building Pathology and Adaptation*. https://doi.org/10.1108/IJBPA-12-2021-0169.

Alharbi, R. K. (2023). Early impact of COVID-19 on private sector employees finance homeownership in Kingdom of Saudi Arabia. *International Journal of Housing Markets and Analysis*, 16(1), 5-21. https://doi.org/10.1108/IJHMA-08-2021-0093.

Allen-Coghlan, M., McQuinn, K., & O'Toole, C. (2020). Assessing the impacts of COVID-19 on the Irish property market: An overview of the issues. *Quarterly Economic Commentary*, Autumn 2020, ESRI Forecasting Series QEC2020AUT. Dublin: ESRI. https://doi.org/10.26504/qec2020aut.

Al-Mansour, J. F. & Al-Ajmi, S. A. (2020). Coronavirus 'COVID-19' supply chain disruption and implications for strategy, economy, and management. *The Journal of Asian Finance, Economics and Business (JAFEB), 7*(9), 659-672.

Anthony, J. (2022). Housing affordability and economic growth. *Housing Policy Debate*, 1-19.

Arum, C., Fraser, H., Artenie, A. A., Bivegete, S., Trickey, A., Alary, M., Astemborski, J., Iversen, J., Lim, A.G., MacGregor, L., & Morris, M. (2021). Homelessness, unstable housing, and risk of HIV and hepatitis C virus acquisition among people who inject drugs: A systematic review and meta-analysis. *The Lancet Public Health, 6*(5), e309-e323.

Ayala, L., Barcena-Martín, E., Canto, O., Navarro, C. (2022). COVID-19 lockdown and housing deprivation across European countries. *Social Science & Medicine, 298* (2022) 114839. https://doi.org/10.1016/j.socscimed.2022.114839.

Barkey, P. (2022). *Where housing is headed*. Montana Business Quarterly. Bureau of Business and Economic Research.

Belej, M. (2021). Housing price forecasting in selected polish cities during the COVID-19 pandemic. *Geomatics and Environmental Engineering, 15*(4), 59-80. https://doi.org/10.7494/geom.2021.15.4.59.

Brunet, M. (2020). *The European cooperation facing the COVID-19 crisis in the social housing sector. The example of Housing Europe*. Master's thesis, Institut D'urbanisme De Lyon, Universite De Lyon. https://doi.org/10.13140/RG.2.2.24041.72808.

Buchwald, H., Avidor, Y., Braunwald, E., Jensen, M. D., Pories, W., Fahrbach, K., & Schoelles, K. (2004). Bariatric surgery: a systematic review and meta-analysis. *JAMA, 292*(14), 1724-1737.

Byambasuren, O., Cardona, M., Bell, K., Clark, J., McLaws, M. L., & Glasziou, P. (2020). Estimating the extent of asymptomatic COVID-19 and its potential for community transmission: Systematic review and meta-analysis. *Official Journal of the Association of Medical Microbiology and Infectious Disease Canada, 5*(4), 223-234.

Cassells, R., Duncan, A., Dockery, M., Kiely, D., & Mavisakalyan, A. (2020). *Potential job losses in the COVID-19 pandemic.* Bankwest Curtin Economics Centre, COVID-19 Research Brief, 2, 1-5.

Chen, L., Chan, A. P., Owusu, E. K., Darko, A., & Gao, X. (2022). Critical success factors for green building promotion: A systematic review and meta-analysis. *Building and Environment, 207*, 108452.

Coventry, P. A., Brown, J. E., Pervin, J., Brabyn, S., Pateman, R., Breedvelt, J., Gilbody, S., Stancliffe, R., McEachan, R. & White, P. L. (2021). Nature-based outdoor activities for mental and physical health: Systematic review and meta-analysis. *SSM-Population Health, 16*, 100934.

Cutcu, I., Atay, G., & Gerlikhan, S. G. (2023). How the consequences of the COVID-19 pandemic affected housing sector? Empirical evidence from Turkey. *Engineering, Construction and Architectural Management.* https://doi.org/10.1108/ECAM-10-2022-0944.

De Jorge-Huertas, V., & De Jorge-Moreno, J. (2023). Connecting the dots between housing design and COVID-19. *Architecture,* 3, 328–343. https://doi.org/10.3390/architecture3020018.

Desmond, M. (2022). Unaffordable America: poverty, housing, and eviction. In: The affordable housing reader (pp. 389-395), American Journal of Sociology. Routledge.

Dunga, S. H. (2023). Housing insecurity during the COVID-19 Pandemic: An application of the Households Housing Insecurity Index (HHII). *Research in Business & Social Science, 12*(2), 229–236. https://doi.org/10.20525/ijrbs.v12i2.2381.

Færøvik, T. (2021). *O bubble, where art thou? An empirical study of the Oslo housing market in the wake of the COVID-19 crisis.* Master's thesis, Norwegian School of Economics. https://doi.org/10.13140/RG.2.2.18529.43365.

Fritsche, U. R., Sims, R. E., & Monti, A. (2010). Direct and indirect land use competition issues for energy crops and their sustainable production: an overview. *Biofuels, Bioproducts and Biorefining, 4*(6), 692-704.

Fuller, G. W., Johnston, A., & Regan, A. (2020). Housing prices and wealth inequality in Western Europe. *West European Politics, 43*(2), 297-320.

Gallent, N., Stirling, P., & Hamiduddin, I. (2022). Pandemic mobility, second homes and housing market change in a rural amenity area during COVID-19 – The Brecon Beacons National Park, Wales. *Progress in Planning*, *November*, 100731. https://doi.org/10.1016/j.progress.2022.100731.

Gehlert, S., Rees, V. W., Choi, K., Jackson, P. D., Sheehan, B. E., Grucza, R. A., Paulson, A., & Plunk, A. D. (2023). COVID-19 Stay-at-home orders and second-hand smoke in public housing. *American Journal of Preventive Medicine.* https://doi.org/10.1016/j.amepre.2023.02.024.

Immergluck, D. (2021). Housing policy recommendations for the Biden/Harris administration. *Housing Policy Debate*, *31*(6), 1050–1053. https://doi.org/10.1080/10511482.2021.1909238.

Ioannidis, J. P. (2020). Global perspective of COVID 19 epidemiology for a full cycle pandemic. *European journal of clinical investigation, 50*(12), e13423.

Ismail, M., Warsame, A., & Wilhelmsson, M. (2022). An exploratory analysis of housing and the distribution of COVID-19 in Sweden. *Buildings, 12,* 71. https://doi.org/10.3390/buildings12010071.

Jay, J., Sareen, A., Hassan, N., Dumlao, N., Jose, K., Haza, I., Wadhwa, A., & Gunturu, S. (2022). Tolerability of Ziprasidone Use in Children and Adolescents: A Prisma Model: Systematic Review and Meta-Analysis. *European Psychiatry, 65*(S1), S142-S142. https://doi.org/10.1192/j.eurpsy.2022.383.

Kadi, J., Schneider, A., & Seidl, R. (2020). Short-term rentals, housing markets and COVID-19: Theoretical considerations and empirical evidence from four Austrian cities. *Critical Housing Analysis,* 7(2), 47-57. https://doi.org/10.13060/23362839.2020.7.2.514.

Khirfan, L., Peck, M., & Mohtat, N. (2020). Systematic content analysis: A combined method to analyze the literature on the daylighting (de-culverting) of urban streams. *MethodsX*, 7, 100984. https://doi.org/10.1016/j.mex.2020.100984.

Kim, K., & Cho, K. T. (2021). A review of global collaboration on COVID-19 research during the pandemic in 2020. *Sustainability, 13*(14), 7618.

Kim, S., Lim, B. T., & Kim, J. (2017). Green features, symbolic values and rental premium: Systematic review and meta-analysis. *Procedia Engineering, 180,* 41-48.

Kole, K. (2022). Housing vouchers reduce residential crowding. *Journal of Housing Economics*, *55*, 101822. https://doi.org/10.1016/j.jhe.2021.101822.

Kulander, M., & Wilhelmsson, M. (2021). What determines the supply of housing for the elderly, and how is it related to the spread of COVID-19? *Journal of Housing for the Elderly*, *0*(0), 1–24. https://doi.org/10.1080/26892618.2021.1963386.

Liu, S. (2022). The influence of the COVID-19 on Hong Kong housing price. *BCP Business & Management, 32*, 337–342.

Liu, Y., & Tang, Y. (2021). Epidemic shocks and housing price responses: Evidence from China's urban residential communities. *Regional Science and Urban Economics*, *89* (September 2020), 103695. https://doi.org/10.1016/j.regsciurbeco.2021.103695.

Mantesi, E., Chmutina, K., & Goodier, C. (2022). The office of the future: Operational energy consumption in the post-pandemic era. *Energy Research & Social Science, 87*, 102472.

McClure, K. (2010). Are Low-Income Housing Tax Credit Developments locating where there is a shortage of affordable units? *Housing Policy Debate, 20(*2), 153-171.

Moayedi, H., Mosallanezhad, M., Rashid, A. S. A., Jusoh, W. A. W. & Muazu, M. A. (2020). A systematic review and meta-analysis of artificial neural network application in geotechnical engineering: Theory and applications. *Neural Computing and Applications, 32*, 495-518.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D., G. & The PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6(7), 1-6.

Morgan, A. K. & Ibrahim, R. (2021). Social distancing and COVID-19: The housing dimension and implications for housing policy. *Advances in Sociology Research. 35*, 97–123.

Mottillo, S., Filion, K. B., Genest, J., Joseph, L., Pilote, L., Poirier, P., Rinfret, S., Schiffrin, E. L. & Eisenberg, M. J. (2010). The metabolic syndrome and cardiovascular risk: a systematic review and meta-analysis. *Journal of the American College of Cardiology, 56*(14), 1113-1132.

Musa, G. U., Adeogun, A. S. & Durosinmi, W. A. (2020). *Effects of COVID-19 on urban housing delivery and affordability in Nigeria. International Journal of Real Estate Studies, 14*(2), 195-204.

Nayal, P., Pandey, N. & Paul, J. (2022). Covid 19 pandemic and consumer employee organization wellbeing: A dynamic capability theory approach. *Journal of Consumer Affairs, 56*(1), 359-390.

Nurick, S., and Thatcher A. (2021). Enhanced indoor environmental quality and the link to individual productivity and organisational performance: A scoping review. *Journal of African Real Estate Research*, 6(2), 84-116. https://doi.org/10.15641/jarer.v6i2.1062.

Ogunbiyi, J. O., Oladokun, T. T. & Emmanuel, O. F. (2022). Isomorphism of client satisfaction and client sophistication in client influence on valuations: A systematic content analysis. *21st African Real Estate Society Conference,* 6-9 September 2022, Accra, Ghana (pp. 458-491).

Ogunbiyi, J. O., Adeleke, F. G, & Oladimeji, D. E. (2023). Ethical delimitation of client satisfaction, client sophistication and client influence in property valuation practice in Nigeria. *53rd Annual Conference of the Nigerian Institution of Estate Surveyors and Valuers*, 19-24 June 2023, Ilorin, Nigeria.

Ohanian, L. E. (2021). *Common-sense policy reforms for California housing.* Cato Institute, Policy Analysis 920.

Otache, I. (2020). The effects of the COVID-19 Pandemic on the Nigeria's economy and possible coping strategies. *Asian Journal of Social Sciences and Management Studies, 7*(3), 173-179.

Paul, T., Chakraborty, R. & Anwari, N. (2022). Impact of COVID-19 on daily travel behaviour: A literature review. *Transportation Safety and Environment, 4*, tdac013. https://doi.org/10.1093/tse/tdac013.

Reyes, A. (2020). Mexico's housing paradox: Tensions between financialization and access. *Housing Policy Debate, 30*(4), 486-511.

Romano, A. (2021). The shifting geographies of digital intermediation: the effects of the COVID-19 pandemic on short-term rentals in Italian cities. *Digital Geography and Society, 2 (2021) 100019.* https://doi.org/10.1016/j.diggeo.2021.100019.

Rosen, E. (2020). *The Voucher Promise: "Section 8" and the Fate of an American Neighborhood.* Princeton University Press.

Salajegheh, S., Ardestani, M. M., Fawzy, M., Ghorbanzadeh, A., Noor, M. I. M., Saline, K. R. & Duarte, P. M. (2022). What Are the Impacts of COVID-19 Pandemic on the Global Aquaculture Industry? The First Systematic Literature Review. Research Square. https://doi.org/10.21203/rs.3.rs-1945090/v1.

Samari, D., & Groot, S. (2023). Potentially exploring homelessness among refugees: a systematic review and meta-analysis. *Journal of Social Distress and Homelessness, 32*(1), 135-150.

Seuring, S., & Gold, S. (2012). Conducting content-analysis based literature reviews in supply chain management. *Supply Chain Management, 17*(5), 544–555. https://doi.org/10.1108/13598541211258609.

Sharma, P., Kaur, M., & Narwal, G. (2020). Other side of the COVID-19 Pandemic: A review. *Pharma Innov, 9*, 366-369.

Stonehouse, D., & Hodgkin, S. (2023). *Housing affordability and homelessness in the Hume Region – Victoria 2016.* La Trobe University; Albury-Wodonga.

Sururi, A. (2022). Housing policy capacity and Indonesian response to the COVID-19 pandemic. *Journal of Wellbeing Management and Applied Psychology, 5*(4), 11–17. https://doi.org/10.13106/jwmap.2022.Vol5.no4.11.

Taşan-Kok, T., Legarza, A., & Özogul, S. (2022). Governing regional affordability: Rethinking the production of affordable spaces across the Metropolitan Region Amsterdam (MRA). *Regional Studies*, *0*(0), 1–16. https://doi.org/10.1080/00343404.2022.2120979.

Tembo, S., & Chidede, T. (2022). COVID-19 regulations and the inequality gap in education and housing in South Africa. In: N. Dorasamy (Ed.), *Governance Challenges During the COVID-19 Pandemic in Africa.* https://doi.org/10.1007/978-3-031-11244-7_9.

Tumamao-Guittap, G. (2021). *Layers and Flows: Safety Nets and Survival Strategies for the Housing Sector*. The Shelter.

Tusting, L. S., Ippolito, M. M., Willey, B. A., Kleinschmidt, I., Dorsey, G., Gosling, R. D., & Lindsay, S. W. (2015). The evidence for improving housing to reduce malaria: a systematic review and meta-analysis. *Malaria Journal, 14*(1), 1-12.

Uchehara, I., Hamma-Adama, M., Obiri, K. A., Jafarifar, N., & Moore, D. (2020). Impacts and risk management of COVID-19 pandemic on real estate supply chain. *International Journal of Real Estate Studies, 14*(S1), 41-53.

Üçoğlu, M., Keil, R., & Tomar, S. (2021). Contagion in the markets? COVID-19 and housing in the Greater Toronto Area. *Built Environment, 47*(3), 355-366. https://doi.org/10.2148/benv.47.3.355.

Ullah, F., Sepasgozar, S. M. E., & Wang, C. (2018). A systematic review of smart real estate technology: Drivers of, and barriers to, the use of digital disruptive technologies and online platforms. *Sustainability*, 10(9). https://doi.org/10.3390/su10093142.

van Haaften, M., Liu, Y., Wang, Y., Zhang, Y., Gardebroek, C., Heijman, W., & Meuwissen, M. (2021). Understanding tree failure: A systematic review and meta-analysis. *PloS One, 16*(2), e0246805. https://doi.org/10.1371/journal.pone.0246805.

Van-Wee, B. & Banister, D. (2016). How to write a literature review paper? *Transp Rev,* 36, 278–288.

Veeroja, P., Goodall, Z., Guity-Zapata, N. A. & Stone, W. (2023). Private renters in shared housing: Investigating housing conditions and mental well-being in Australia. *Journal of Housing and the Built Environment*. https://doi.org/10.1007/s10901-023-10038-w.

Vernice, R. R. & Silva, B. F. (2023). Necropolitics and the COVID-19 pandemic: Evictions and removals that mark the recurrent housing problem in Brazil. *Acta Scientiarum, 45*, 61496*,* 1–11. https://doi.org/10.4025/actascitechnol.v45i1.61496.

Wang, B. (2022). Housing market volatility under COVID-19: Diverging response of demand in luxury and low-end housing markets. *Land Use Policy*, *119*(April), 106191. https://doi.org/10.1016/j.landusepol.2022.106191.

Weller, S., & Van Hulten, A. (2012). Gentrification and displacement: the effects of a housing crisis on Melbourne's low-income residents. *Urban Policy and Research, 30*(1), 25-42.

WHO (2022). 14.9 million excess deaths associated with the COVID-19 pandemic in 2020 and 2021. https://www.who.int/news/item/05-05-2022-14.9-million-excess-deaths-were-associated-with-the-COVID-19-pandemic-in-2020-and-2021. Accessed: 26/07/27.

Worldometer (2023). COVID-19 Coronavirus Pandemic. https://www.worldometers.info/coronavirus/#countries. Accessed: 26/07/27.

Wuni, I. Y. & Shen, G. Q. (2020). Barriers to the adoption of modular integrated construction: Systematic review and meta-analysis, integrated conceptual framework, and strategies. *Journal of Cleaner Production, 249,* 119347.

Yao, J., He, Z., Chen, Y., Xu, M., Shi, Y., Zhang, L. & Li, Y. (2019). Acupuncture and weight loss in Asians: A PRISMA-compliant systematic review and meta-analysis. *Medicine, 98*(33).

Yoade, A. O., Ayodeji, Olatunji, S. A. & Cirella, G. T. (2023). COVID-19 and the built environment: Informal sector, housing, and shock challenges in Nigeria. In: G. T. Cirella (Ed.), *Uncertainty Shocks in Africa,* Advances in African Economic, Social and Political Development. https://doi.org/10.1007/978-3-031-21885-9_9.

Zeng, S. & Yi, C. (2022). Impact of the COVID 19 pandemic on the housing market at the epicenter of the outbreak in China. *SN Business & Economics*, *2*(53), 1–20. https://doi.org/10.1007/s43546-022-00225-2.

Zivkovic, M. & Stamenkovic, M. (2021). An empirical study on the correlation between on the housing conditions and COVID-19 pandemic in Serbia. Proceedings of the XXI International Scientific Conference on Construction and Architecture VSU' 2021, October 14-16, Sofia, Bulgaria.