An Investigation of the Impact and Resilience of British high streets following the COVID-19 lockdown restrictions

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Summary

The COVID-19 pandemic has created a need to quantify the impacts of and resilience to the retail-specific lockdownson British high streets. The concept of resilience has become widely used in academic research but has not accounted for the impacts of sweeping government restrictions during the pandemic. The aim of this paper is to use the concept of resilience to analyse the impact of government-enforced closures of 'non-essential' retail stores on British high streets by producing a high street resilience classification based on the proportion of stores forced to close and indicators that influence an area's ability to withstand shock.

KEYWORDS: Retail vibrancy, retail areas, high streets, classification

1. Introduction

Retail resilience can be used to measure the persistence of retail areas to respond to economic or cultural shock (Holling, 1973; Hollnagel et al., 2006). While the term 'resilience' has a long presence in the fields of engineering and physical sciences, it was the 2008 recession that embedded the concept within the social sciences (Dawley et al., 2010). Although there are many models for measuring resilience, each high street and its governing authority will have specific criteria to capture sustainability and regeneration. That said, a national measurement of resilience is a useful tool for planning since it enables a baseline for comparison between areas. It can also reveal the differences in ability to withstand external shocks, often driven by the geographical contexts in which they operate, a factor that can be overlooked in policy strategies (Whitworth, 2021).

In order to fully assess the impact of lockdowns on British high streets, this research explores whether the COVID-19 pandemic compounded pre-existing inequalities for some areas while creating opportunity for others. To achieve this, we develop a series of heuristics to measure high street resilience, including vacancy rates, occupier change and proportion of 'essential' stores. Essential retailers include food shops, supermarkets, hardware stores, off-licences, petrol stations, vehicle repair services, banks, medical services, pet shops, launderettes, and funeral directors. Secondly, the impact of essential stores in Britain during the restrictions and their impact on high street performance will be analysed. Finally, the study uncovers those high streets in Britain that were more adaptable to change during the COVID-19 pandemic.

2. Research Design

This paper aims to assess the impact of retail lockdown restrictions between March 2020 and May 2021 in Britain to compare the resilience of high streets. This research utilises 4 high street characteristics to investigate the relationship between pre-pandemic vacancy, occupier change and 'essential' store proportion on post-restriction vacancy through using two Ordinary least squares (OLS) regression models. Consequently, the final outcome of this research is the formation of a high street typology, using the LDC's wide coverage and granular data, created using hierarchal clustering with spatial constraints. **Figure 1** displays an overview of the research design.

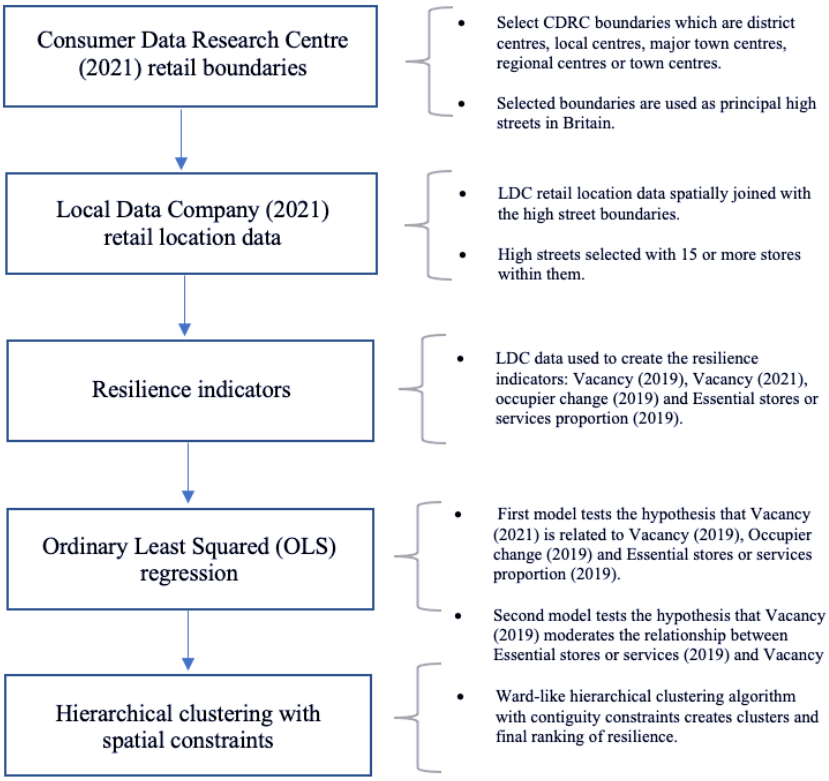

Figure 1 Flowchart displaying an overview of the research design.

2.1 Data

The data used for this research is provided by the Local Data Company (LDC) and comprises the location, occupier status (including if vacant) and retail category (eg. Pub, restaurant) for 500,000 premises in Britain. This allows for the identification of stores that were allowed to remain open during periods of lockdown covered here. The end date on the dataset is 28th June 2021.

In addition to store location data, the Consumer Data Research Centre's (CDRC) Retail Centre Boundaries (2021) has been used to define the geographic extent of each of the high streets. An example of the boundaries around the City of London are displayed in **Figure 2.**

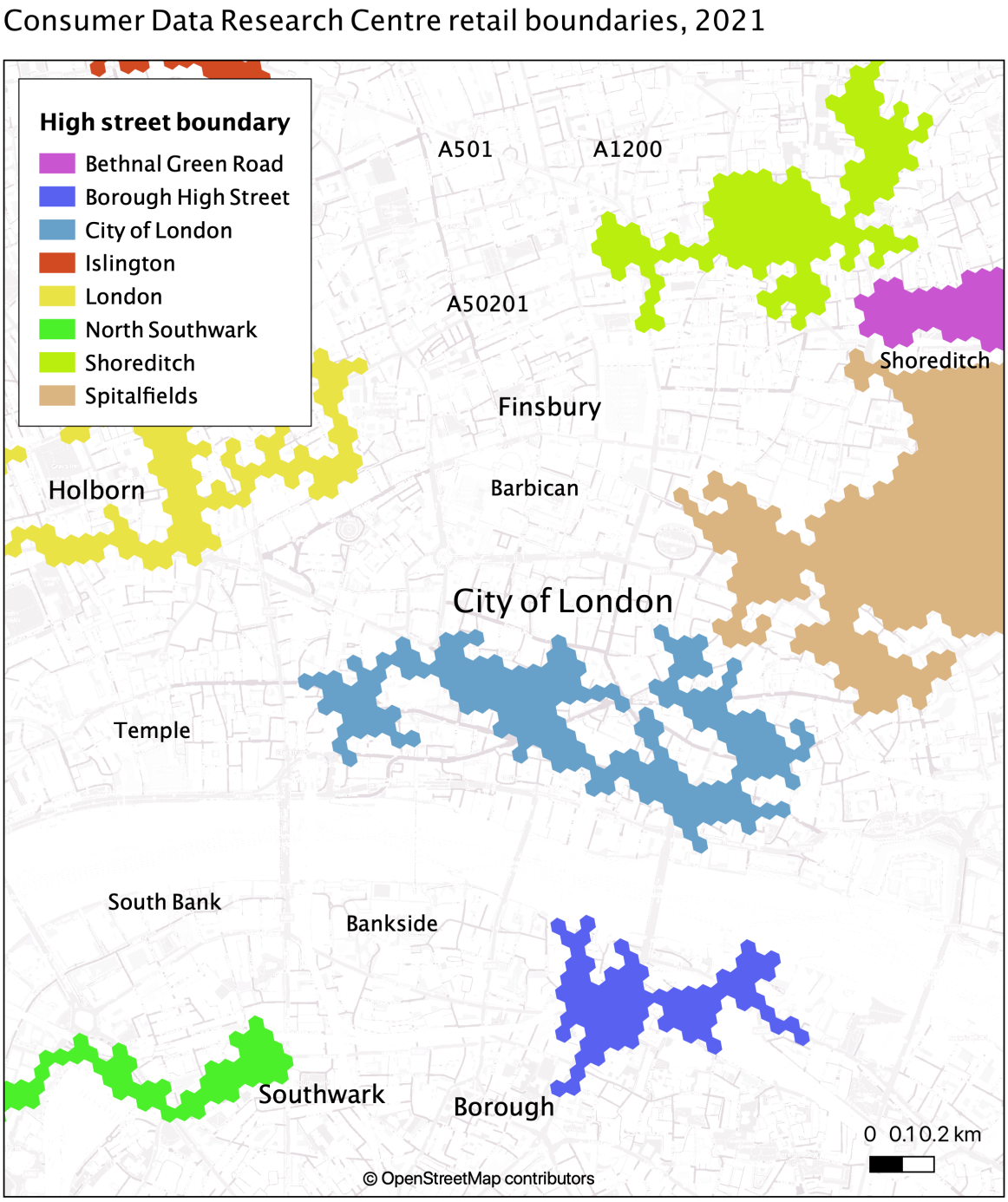

Fig. 2 High streets in London, as defined by the Consumer Data Research Centre's (2021) retail boundaries and filtered to Regional Centres, District Centres, Major Town Centres, Town Centres or Local Centres, in towns or cities with a population over 75,000.

The LDC dataset was then joined with the CDRC retail boundaries. Only the boundaries that included 15 or more retail location points were used within the analysis, a threshold in line with the Office for National Statistics' (ONS) and Ordnance Survey's (OS) joint definition of a 'high-street' (Ordnance Survey, 2019). The resulting 486 areas are used as this paper's boundaries of Britain's high streets. The LDC data within each high street boundary was used to create 4 variables, summarised in **Table 1**: Occupier Change 2019, Vacancy 2019, Vacancy 2021 and Proportion of Essential Stores 2019.

Table 1 Variable specifications

Variable label	Attribute
Vacancy (2019)	6 month average for January- June, 2019 for number of vacant properties/ total stores within a high street.
Vacancy (2021)	Number of vacant properties/ total stores within high street for June 2021.
Occupier change (2019)	Number of new stores opened between January-June 2019/ total number of stores within a high street.
Essential Retail/ Services (2019)	6 month average for January- June, 2019 for number of stores allowed to remain open during lockdown restrictions/ total number of stores within a high street.

2.2 Method

Firstly, OLS regression has been conducted to investigate the influence of the three independent variables on vacancy (2021). Secondly, a geographical typology of high street resilience using all the indicators of resilience has been developed. The variables used within the hierarchical clustering with spatial constraints are Occupier Change, Essential Retail % (2019) and Vacancy (2019). The typology is based on high street characteristics before the pandemic to evaluate which geographical areas and qualities had the lowest rise in vacancy. The method for conducting hierarchical clustering with spatial constraints outlined in Chavent et al.'s (2017) work have been applied to Britain's high streets. The method introduces a geographical constraint as a mixing parameter to set the importance of the constraint in the clustering process and improve the geographical cohesion of the four clusters. More geographically compact clusters were obtained through introducing the matrix of geographical distances. The geographic constraint is an important part of the resilience measurement, enabling us to account for factors such as 'linked shopping behaviour' (Wrigley et al., 2015).

3. Results

Model 1 in **Table 2** shows indicates a clear relationship between the predictor variables and the high street vacancy levels following the lockdown restrictions, despite other additional exogenous variables being excluded (eg. local lockdown restrictions and local authority interventions). From Model 1 it can be observed that Vacancy (2019) has a strong significant effect on Vacancy (2021) ($b=0.84$, $p=<2e-16$). Proportion of essential stores (2019) was found to have a moderate negative effect on Vacancy (2021) ($b=-0.18$, $p=<2e-16$), holding constant all other independent variables. Occupier change was also found to have a moderate negative effect on vacancy (2021) ($b=-0.39$, $p=0.023$). For the independent variables in model 1, the highest VIF value of 1.21 was well below the cut-off measure of 10, suggesting that multicollinearity was not having a biasing effect on the OLS estimations (Menard, 2002).

Model 2 shows the interaction effect between Vacancy and Essential Retail % (2019). It can be observed that Vacancy (2019) retains its significant effect on Vacancy (2021). The model shows that the interaction term is negatively and significantly associated with Vacancy 2021.

Table 2 British high street level vacancy for 2021

Estimation method: Robust OLS

Predictor variables	Model 1: Direct effects			Model 2: Interaction effect	
	Estimate	p-value	VIF	Estimate	p-value
Intercept	12.52***	<2e-16		7.26***	9.17e-07
Vacancy (2019)	0.84***	<2e-16	1.21	1.46***	< 2e-16
Essential stores and services (2019)	-0.18***	<2e-16	1.19	-0.049	0.1338
Occupier change (2019)	-0.39*	0.023	1.02	-0.30	0.0742
Vacancy (2019) X Essential stores and services (2019)				-0.016***	5.47e-06
n	486			486	
R2	0.701			0.7136	
Adjusted R2	0.6991			0.7112	
P value	< 2.2e-16			< 2.2e-16	

*** 0.001, ** 0.01, *0.05 degree of significance

Table 3 displays the 4 different clusters ranked in order of their average rise in high street vacancy following the easing of retail lockdown restrictions.

Table 3 British high street resilience qualities.

Estimation method: Hierarchical clustering with spatial constraints

Resilience (Highest to lowest)	Location	Description
Average stability with low pre-pandemic vacancy, high essential retail and services %	London, South East, East of England, Wales	- Average number of new stores opening pre-pandemic. - Low vacancy pre-pandemic. - Many convenience or essential retail stores and services**,** pre-pandemic. - Lowest increase in vacancy following easing of retail lockdown restrictions.
Stable with moderate pre-pandemic vacancy and essential retail and services %	London, Yorkshire and the Humber, West Midlands, East Midlands, North West, South West, Wales East of England, South East	- Few new stores opening pre-pandemic. - Moderate vacancy pre-pandemic. - Moderate number of convenience or essential retail stores and services**,** pre-pandemic. - Average increase in vacancy following easing of retail lockdown restrictions.
Unstable with high pre-pandemic vacancy, low essential retail and services %	Scotland, North West, North East, East Midlands, Yorkshire and the Humber, West Midlands	- Many new stores opening pre-pandemic. - High vacancy pre-pandemic. - Low proportion of convenience or essential retail stores and services**,** pre-pandemic. - Moderate increase in vacancy following easing of retail lockdown restrictions.
Unstable with average pre-pandemic vacancy, lowest essential retail and services %	London, South West, South East, East of England, Wales	- Many new stores opening pre-pandemic. - Average vacancy pre-pandemic. - Lowest proportion convenience or essential retail stores and services**,** pre-pandemic. - Highest increase in vacancy following easing of retail lockdown restrictions.

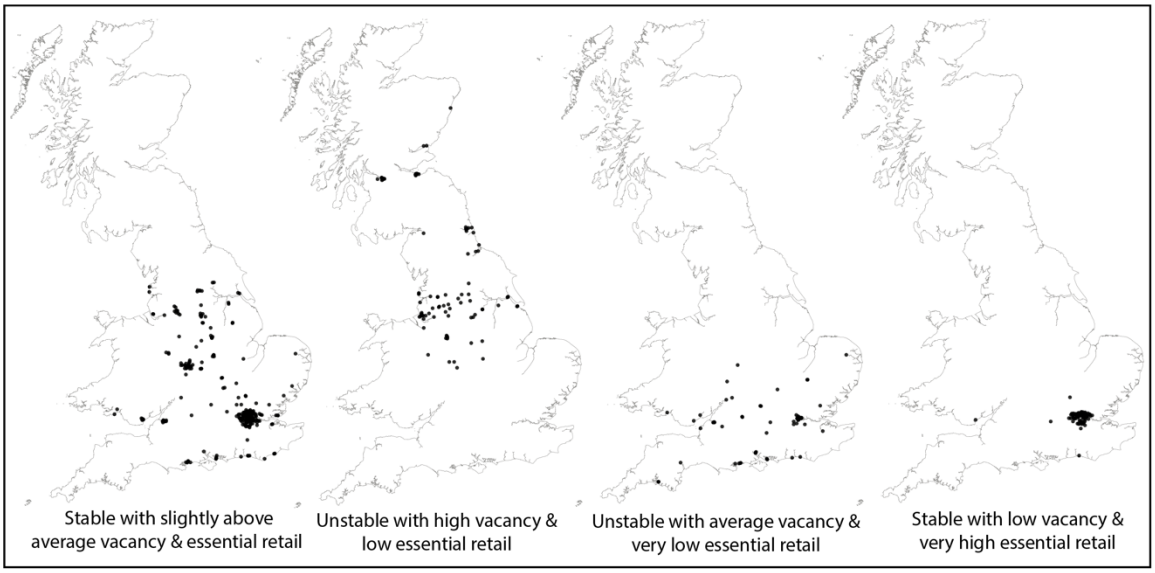

Figure High streets in Britain, as the centroid of the Consumer Data Research Centre's retail boundaries (classified by hierarchical cluster with spatial constraints)

Figure 3 displays the 4 different clusters visually with their associated cluster and resilience qualities. And **Figure 4** displays a hexagonal heatmap of their 2d bin counts. **Figure 5** shows a scatterplot for the relationship between the proportion of essential stores and vacancy following the easing of restrictions. The scatterplot displays the relationship per hierarchical cluster.

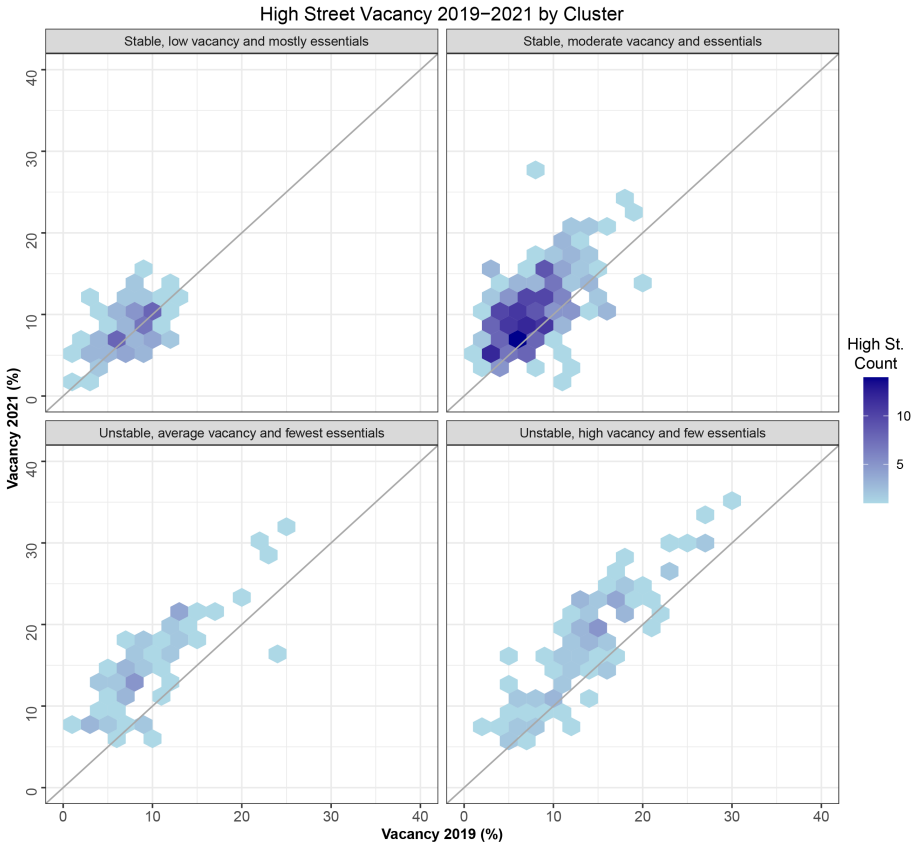

Figure 4 Hexagonal heatmap of 2d bin counts for vacancy, 2019 and vacancy, 2021 (classified by hierarchical cluster with spatial constraints)

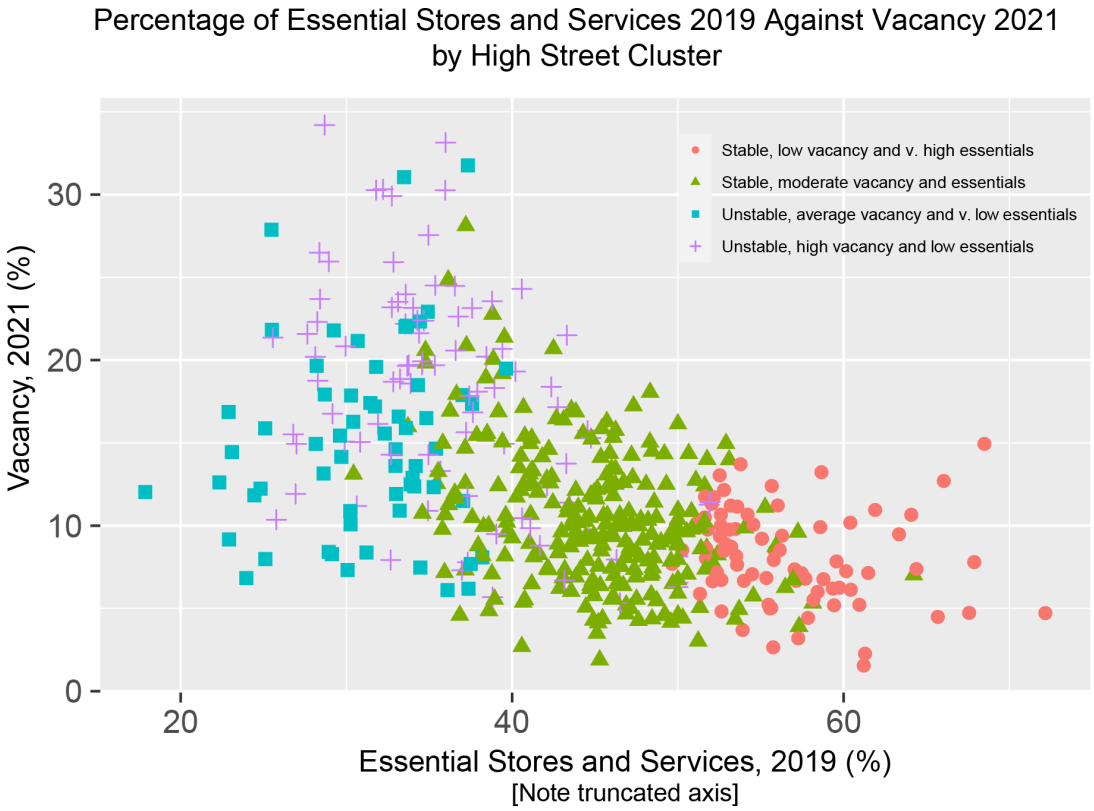

Figure 5 Scatterplot for essential stores and services, 2019 and vacancy, 2021 (classified by hierarchical cluster with spatial constraints)

4. Discussion

High streets with a higher proportion of essential stores before the lockdown restrictions, had lower rates of vacancy following the lifting of the restrictions. Additionally, high streets that had high proportions of essential stores and low vacancy before the pandemic, had resulting lower rates of vacancy in 2021. Therefore, when the pandemic hit, high streets with higher levels of essential stores pre-pandemic were allowed to keep a higher proportion of their stores open during the lockdown, making them more resilient.

The second part of this research developed a typology of high street resilience utilising hierarchical clustering with spatial constraints with the indicators vacancy, essential stores, occupier change and geographical proximity. It revealed that some high streets in London, the South East, the East of England and Cardiff with average occupier change, low pre-pandemic vacancy and high essential stores to have had the lowest rise in vacancy. This group of high streets included Northolt Road in Harrow, London, with the highest proportion of essential stores at 72%, and Wanstead high street, London, which had the lowest vacancy rate following the lockdown restrictions at 2%.

Within this study there is the possibility that the regression model omitted essential explanatory variables leading to errors. Such potential explanatory factors include the impact of the 3 and subsequently 4 Tier system in England between 14th October 2020 and 6th January 2020 where local restrictions were enforced. Further releases in the LDC data in 2022 might provide additional insights to this impact. Through reporting geographical disparities in high street resilience, this paper has aimed to inform discussion related to policy tools for town centre recovery following the lockdowns. Large, up-to-date granular data sets such as that of LDC provides the possibility for local authorities to understand their high streets' composition and resilience qualities. In particular, geographically targeted policies can be tailored to for adaptively resilient areas or those that could benefit from stable occupier conditions.

References

Chavent, M., Kuentz-Simonet, V., Labenne, A. and Saracco, J., 2018. ClustGeo: an R package for hierarchical clustering with spatial constraints. *Computational Statistics*, *33*(4), pp.1799-1822.

Dawley, S., Pike, A., Tomaney, J. (2010). Towards the resilient region?, Local Economy, 25(8), 650–667.

Holling, C. (1973). Resilience and stability of ecological systems, Annual Review of Ecology and Systematics, 4, 1–23.

Hollnagel, E., Woods, D. D., Leveson, N. (2006). Resilience Engineering: Concepts and Precepts. Aldershot: Ashgate.

Whitworth, A., 2021. Spatial Creaming and Parking?: the Case of the UK Work Programme. *Applied Spatial Analysis and Policy*, *14*(1), pp.135-152.

Wrigley, N., Lambiri, D., Astbury, G., Dolega, L., Hart, C., Reeves, C., Thurstain-Goodwin, M. and Wood, S., 2015. British high streets: From crisis to recovery? A comprehensive review of the evidence.

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Biographies

Abigail Hill is a PhD student in Human Geography at University College London. Her research focuses on the spatio-temporal dynamics of the British retail high street industry.