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Published in:
Nordic Journal of Urban Studies

DOI:
[10.18261/njus.3.1.2](https://doi.org/10.18261/njus.3.1.2)

Published: 30/08/2023

Document Version
Publisher's PDF, also known as Version of record

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Please cite the original version:
Rönnberg, O., Page, M., Stjernberg, M., Iltanen, S., Bernelius, V., Vaattovaara, M., & Joutsiniemi, A. (2023). Service-poor suburban housing estates?: Accessibility to local services in the Helsinki metropolitan area, 1996–2018. *Nordic Journal of Urban Studies*, 3(1), 23–43. <https://doi.org/10.18261/njus.3.1.2>



Service-poor suburban housing estates?

Accessibility to local services in the Helsinki metropolitan area, 1996–2018

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Abstract

Since the time of their construction, post-war suburban high-rise housing estates in Finland have been criticised for their lack of local services available to residents. Despite this commonly held understanding of service-poor housing estates, only few empirical studies on the topic exist. Using comprehensive geolocalised business register data for the Helsinki Metropolitan Area for the period 1996–2018, we investigate whether suburban housing estates do indeed have less access to different types of public and private services than other neighbourhoods. We additionally examine whether socio-economic disadvantage, which increasingly is spatialized in these neighbourhoods, is associated with a lack of local services. Our main finding is that the post-war housing estates do not have significantly fewer services than other neighbourhoods, when controlling for their position in the urban structure. We do note several changes to the service structure—a sharp decrease in different types of retail activities, and an increase in particularly restaurants, cafés and bars—and in many housing estates, several types of commercial services have disappeared. However, these structural changes have emerged on a larger scale, and are not specific to the housing estates. The results highlight the need to consider the future access to essential services particularly in those areas, where the prospects for commercial services are weak.

Keywords

Housing estates, suburbs, lähiö, services, accessibility, Helsinki

Introduction

Post-war suburban housing estates are often characterised as mono-functional residential areas in peripheral locations with lacking or poor-quality services (Hall, 1997; Wassenberg, 2018). These estates are often places of concentrated social disadvantage in the Nordic countries (Andersson & Bråmås, 2018; Brattbakk & Hansen, 2004), and as the lives of disadvantaged groups are more local than others (Hedman et al., 2021; Hidayati et al., 2021), a lack of services within a walkable distance may severely decrease residents' access to essential resources. However, few studies have empirically examined the level of services, such as schools, health care, shops, restaurants and leisure activities, in the suburban housing estates. In this paper, we analyse the service supply in post-war suburban housing estates in the Finnish capital region. Do these high-rise housing estates, referred to as *lähiö* in Finnish, have worse access to local services than other neighbourhoods, and have their declining socioeconomic trajectories been associated with a loss of services in recent decades?

The Finnish word *lähiö* generally refers to residential areas that developed on the outskirts of cities and are usually dominated by multi-story apartment blocks constructed in the 1960s and 1970s (Hurme, 1991; Lankinen, 1998). In other words, the term refers to both a peripheral location within the urban area as well as to certain common physical characteristics of the housing area. *Lähiö*, however, is also often charged with negative connotations, and it can also be seen as a symbolic category for certain types of environments and their residents (Ilmonen, 1994, 2016; Roivainen, 1999; Saarikangas, 2002).

From the time of their construction, *lähiös* were depicted as service-poor and dreary living environments. *Lähiös* were of various sizes and scale, but mostly shared a peripheral position in the urban structure. The aim at the time was that they should function as self-contained entities, providing the services needed in everyday life (Hankonen, 1994, p. 467; Hess et al., 2018; Hurme, 1991; Wassenberg, 2018). These goals were generally not achieved, partly due to their location, and many of the *lähiös* which did initially have good services are reported to have lost most of them in the following years (e.g., Ilmonen, 2016, p. 112). It has been suggested that the number of services in a *lähiö* is negatively associated with its unemployment rate and positively with its income level (Lankinen, 1998). The deteriorating service environment has been a key focus in subsequent *lähiö* development projects which have sought to improve or maintain public services in the *lähiös* (Karjalainen, 2004; Ministry of the Environment, 1985).

The mass-construction of *lähiös* was a reaction to the rapid urbanisation of Finland and the urgent need for housing it constituted, and coincides with the motorisation of the Finnish society. These developments totally changed the way of living and the physical organisation of the society. With growing automobility and urban sprawl, the logics of retail changed—from local corner shops to department stores and shopping malls in locations easily accessible by car (Culley, 2020; Paakkanen, 1975; Rehunen et al., 2018). This development has only continued and been further intensified by other postmodern developments.

After the heyday of the Nordic welfare state, social inequalities began to grow due to a deep economic recession, structural shifts in the economy and labour market, and the emergence of new spatial concentrations of disadvantage (Bernelius & Vaattovaara, 2016; Vaattovaara & Kortteinen, 2003). Unemployment rates sky-rocketed and towards the end of the decade, 'pockets of poverty' could be identified clustering particularly to *lähiö*-type neighbourhoods (Vaattovaara, 1998). This process of socioeconomic segregation has continued (Kortteinen & Vaattovaara, 2015), along with corresponding ethnic segregation as immigration to Finland has grown (Vilkama, 2011). Urban social disadvantage is now highly spatialized in the

lähiö, and the social trajectories of the *lähiö* neighbourhoods have been fairly path-dependent (Stjernberg, 2019).

In this paper, we explore the trajectories of service accessibility in *lähiö* areas (n=98) in the Helsinki metropolitan area (HMA) from the mid-1990s to this day. Using detailed geo-located data of all enterprises and establishments in the HMA, we map the number and distribution of services in residents' immediate neighbourhoods, and the change therein over time. We aim to answer the following questions:

1. Are the suburban housing estates in HMA service-poor in relation to other types of neighbourhoods, and how has the type and number of services changed since the 1990s?
2. Is the socioeconomic composition of a neighbourhood related to residents' access to services?
3. Which factors explain variances in local access to services on an urban-regional level, and how is service accessibility differentiated among *lähiö* neighbourhoods?

Background

History of the *lähiö*

The rapid urbanisation of the 1960s and 1970s put pressure on accommodating the growing urban population. This housing question was solved by building new high-rise housing estates, often in poorly connected places at the outskirts of urban areas. Since their construction, these estates have been portrayed as dreary living environments without a sufficient level of services, and nothing to do (e.g. Kortteinen, 1982). Whilst it has its own specificity, the Finnish *lähiö* share these characteristics and common complaints with other large housing estates throughout Europe (Dekker et al., 2005), including the German *Großwohnsiedlung* and the *Grands Ensembles* of France. Parallels can also be found with post-war suburban high-rise developments in North America, where, for instance, the inner high-rise suburbs of Toronto suffer from decline, disadvantage, and lack of social services, healthy food and public transport (Young, 2017).

The international neighbourhood unit concept, which was also the basis of Finnish *lähiö* planning (Hurme, 1991; Meurman, 1947), was designed to be an autonomous unit that satisfies the most basic needs of people's daily lives. The size of this unit is a population sufficient to support one elementary school, which is the central institution of each neighbourhood (Perry, 1929). The social goals of the neighbourhood unit were reinforced, especially as the concept was embraced as a key part of urban planning in Britain with government support (Abercrombie, 1945; Ministry of Health, 1944). The failure to achieve many of the social goals made the concept a controversial planning method for decades (Goss, 1961; Homer, 2000; Pitt, 1959).

For the earliest *lähiös*, their peripheral location and relatively small size made provision of an adequate level of services, including public transport, rather impossible, leading to the emergence of more or less mono-functional sleeping suburbs that could not fulfil the everyday needs of its residents. As a response, larger estates housing more than 10,000 inhabitants became the goal of suburban development towards the 1970s, with the idea that these estates would constitute diverse and dynamic living environments with schools, shops, workplaces and places for social life (Hurme, 1991; Seppälä et al., 1990). Despite the larger size of the newer estates, these goals were mostly not achieved: the number of services was still low, transport connections insufficient and, in comparison with their earlier counterparts, the natural environment of the new estates was poor (Ministry of the Environment, 1985; Roivainen, 1999).

In suburban housing estates, services have usually been clustered to a local shopping centre, in Finland colloquially known as *ostari*. These were usually constructed only years after residents had moved in, and the number and quality of services was often limited, satisfying only basic needs (Dekker & van Kempen, 2005, pp. 21, 39–40). The *ostaris*, which functioned as the heart of many suburban housing estates, saw a rapid restructuring of their service profile during the deep economic recession in the 1990s. Their service supply became in many cases more unbalanced and limited in range: as many vacant premises were filled by bars and pubs, many *ostaris* became places of perceived unsafety and social problems (Harjunen & Mäenpää, 2015). Failing to react to these societal and urban structural changes, it is argued that they in many cases have lost their relevance as service centres (Halme et al., 2001; Krokfors, 2013).

With time, the ideals of neighbourhood unit planning included a change in scale, from block level to district level, as well as an intensification of the hierarchism of the street network (Pakarinen & Hurme, 1988). During the two decades of mass construction of *lähiös*, private car ownership exploded from 0.2 to 1.2 million vehicles in Finland (OSF, 2022a). As a result of the change in neighbourhood scale, along with the increase in mobilisation, the size of the easily accessible neighbourhood expanded. Service providers also responded to this change in hierarchy, increasingly locating outside the neighbourhood, contradicting the original idea of *lähiö* as autonomous units (Alppi & Ylä-Anttila, 2007; Joutsiniemi, 2010). Commercial services in particular have tended to position themselves in highly accessible locations on the road and rail networks as the neighbourhood expands and the scale of mobility increases. During the study period, more than 20 large shopping malls have been built in the HMA (Figure 1), and there has been a growing trend to also cluster diverse public services in these shopping malls; cities such as Espoo are explicitly pursuing this strategy (City of Espoo, 2021). The growth of online shopping (ITA, 2022) might further affect provision of retail services in residential neighbourhoods.

Services, segregation and social equity

Services are among the key amenities of the neighbourhood that affect residents' health and wellbeing, even when controlling for individual level factors (Ellaway & Macintyre, 2009; Macintyre et al., 1993). Proximate services have been found to increase walking and cycling for transport, improving residents' physical health, although these effects have been found to vary across neighbourhoods (Elldér et al., 2022; McCormack et al., 2008). The presence of institutions, facilities and public spaces in a neighbourhood is also connected to higher levels of social capital and collective efficacy, and lower levels of disorder, on the neighbourhood level, enabling residents to access opportunities through their local networks (Altschuler et al., 2004; van Bergeijk et al., 2008; Curley, 2010; Nast & Blokland, 2014). Indeed, when local services were not available in the *lähiö*, the desired social benefits also failed to materialise with face-to-face encounters of daily life lacking or occurring elsewhere (Greenhalgh, 2016).

Retail and commercial services can positively contribute to street life as lingering and window-shopping activities increase opportunities for passive and active social interaction (Mehta & Bosson, 2010). Small ethnic retailers in particular are argued to be important in enhancing urban life and culture, functioning as informal gathering places for residents (Hewidy & Lilius, 2022). On the other hand, lack of sufficient services and institutions in the neighbourhood can have a detrimental effect on not only residential satisfaction (Korhonen, 2008), but also particularly disadvantaged groups' opportunities and outcomes (Church et al. 2000; Galster, 2012; Wacquant, 2008).

Whereas commercial businesses may locate themselves on the basis of market criteria,

local or regional authorities and decision-makers in Finland maintain full control over the allocation of public services within their jurisdiction. Much of the important social infrastructure is also funded and administered by the public sector (Klinenberg, 2018), however the balance between publicly and privately funded services is changing (Glaeser, 2013). As the Nordic welfare state lies on a heavy notion of egalitarianism, it should therefore be responding to social equity and needs-based criteria in allocation of services. However, there is evidence of political rationing in Finland and Sweden regarding public services, as poor local representation in municipal decision-making is associated with higher risk for public school closures (Folke et al., 2020; Harjunen et al., 2023).

A body of literature has focused on the relationship between population structure and urban amenities. Demand for consumption amenities has been seen to increase in recent decades, particularly with increasing education and income, and has been associated with the resurgence of big cities (Glaeser & Gottlieb, 2006). Some of these consumption amenities and services may be endogenous, responding to local population characteristics (e.g. high income or education), and different services may have different amenity values for different population groups which can for example lead to gentrification and residential migration (Baum-Snow & Hartley, 2020; Brueckner et al., 1999).

Accessibility is highly dependent on the opportunities to exercise mobility, that is, the available means of transport. As disadvantaged residents more often have constrained opportunities to own a car or use public transport, they are more dependent on the opportunities available locally. Particularly in the United States, access to healthy and affordable food can differ considerably based on income and race, where poor neighbourhoods are poorly served with fresh food outlets (Morland et al., 2002). Findings that low-income residents in the United States and the UK live closer to basic services than high-income residents seem to be related to them living in dense inner-city locations (Bailey et al., 2015; Barbosa et al., 2021). The more recent “suburbanization of poverty” in these societies has, however, led to decreased access to services and work opportunities namely for low-income groups (Zhang & Pryce, 2020).

Evidence of “food deserts” outside the United States is weak (Beaulac et al., 2009). In the Nordic context, disadvantaged groups are found to have even better access to food stores than other population groups, although distances have increased (Amcoff, 2017). This also applies to other service types: lower-income residents do not generally have worse access to services than higher-income residents, but the *types* of service which are accessible may differ between different population groups. Disadvantaged groups living in more peripheral parts of the city regions may have quite limited access to services, but in Sweden, Elldér et al. (2018) showed that elderly and low-income residents have better access to a multitude of services within half a kilometre from their home than the average Swede. In particular, for low-income people, accessibility to services by proximity had improved markedly since the 1990s, with the exception of grocery stores.

Although there is no evidence of a deprivation amplification model, where a neighbourhood’s low socioeconomic status would induce service deprivation (Macintyre et al., 2008), there are differences in the type and diversity of neighbourhood services across population groups and neighbourhood types, for instance due to service providers’ different locational strategies. Public services appear to be relatively equally distributed across neighbourhoods, and usually have good accessibility in poorer neighbourhoods, while some private services may seek to locate in areas with higher purchasing power or other locational advantages (Apparicio & Séguin, 2006; Macintyre et al., 2008; Siltaloppi & Puhto, 2011).

Data and methods

Study area

The Helsinki metropolitan area (HMA) is the capital city region of Finland and consists of the municipalities of Helsinki, Vantaa, Espoo and Kauniainen¹. It is the largest and most rapidly growing city region in Finland: during the period of this study, from 1996 to 2018, the population of HMA grew by 30 percent from 0.9 million to 1.2 million residents, and it is one of few regions which are experiencing population growth in Finland (OSF, 2022b). In Helsinki and Vantaa, the population is heavily concentrated along the train and metro lines, while Espoo more clearly is a polycentric city with several equally sized centres. Alongside new urban developments, the metro and rail lines have been extended during the study period. The western part of the region (Espoo, Kauniainen) is generally more affluent, low-rise (40% of dwellings in detached or row houses) and has higher car-ownership rates (Figure 1).

Socio-spatial mixing as a preventative measure for segregation has been actively pursued in the region already since the 1960s, producing smaller ‘pockets of poverty’ scattered throughout the region. These patches have been growing in both size and number (Vaattovaara et al., 2018), located particularly in the east and north parts of the region, and are over-represented in the *lähiös*.

Data

Register data detailing the locations of all the businesses and public corporations within the HMA (Table 1) was obtained from *SeutuCD*, a regional geographical data package produced and published by Helsinki Region Environmental Services (HSY).

Table 1. Datasets used in the study.

Data	Source	Type	Statistical date	
			1996	2018
Service data (private)	SeutuCD/SeutuData (HSY)	point	1996	2018
Service data (municipal)	SeutuCD/SeutuData (HSY)	point	1997	2018
Population	SeutuCD (HSY)	point	1996	2018
Population structure	Grid Database 250m x 250m (Statistics Finland)	polygon	2000	2019
Education structure	Grid Database 250m x 250m (Statistics Finland)	polygon	2000	2019
Disposable income	Grid Database 250m x 250m (Statistics Finland)	polygon	2000	2018
Workplaces	Grid Database 250m x 250m (Statistics Finland)	polygon	2000	2018
Road network	Terrain Database (Finnish Land Survey)	polyline	2000*	2018
Lähiö classification	Stjernberg (2019)	polygon	2010–12	2010–12

Note: Historical road network was constructed subtracting new segments from 2018 network.

Population data geolocated to the building level was obtained from *SeutuCD*, and a more comprehensive population database aggregated to a 250 m × 250 m grid level was obtained from the *Grid Database* (Statistics Finland). The grid-level population data include socio-demographic variables, such as household income, educational attainment, and main type of activity, which are used in the regression analysis. The road data, used for calculating distances to specific urban features, was filtered to exclude pedestrian and bicycle roads to ensure consistency across the time periods.

1. In 2008, the Östersundom district from the municipality of Sipoo was merged to the city of Helsinki. In this study, we use the pre-2008 municipal division, as data from 1996 does not include Östersundom.

Lähiö areas were identified using a dataset produced by Mats Stjernberg (2019). This dataset was constructed using a GIS-based selection method and relying on georeferenced statistical data at 250 m × 250 m grid level. A total of 603 *lähiö* areas were identified in Finland, of which 98 are in HMA. These areas are ones that are located outside of the main urban centres, where at least half of the total population lives in multistorey apartment buildings constructed between 1960–1979, and where there are at least five of these specific buildings within close range of each other within the area (Stjernberg, 2019). For our analysis, we classified each populated grid cell as either *lähiö*, other high-rise suburb (>50% of dwellings in apartment buildings), low-rise suburb, or inner city (Helsinki city districts 1–27) (Figure 1).

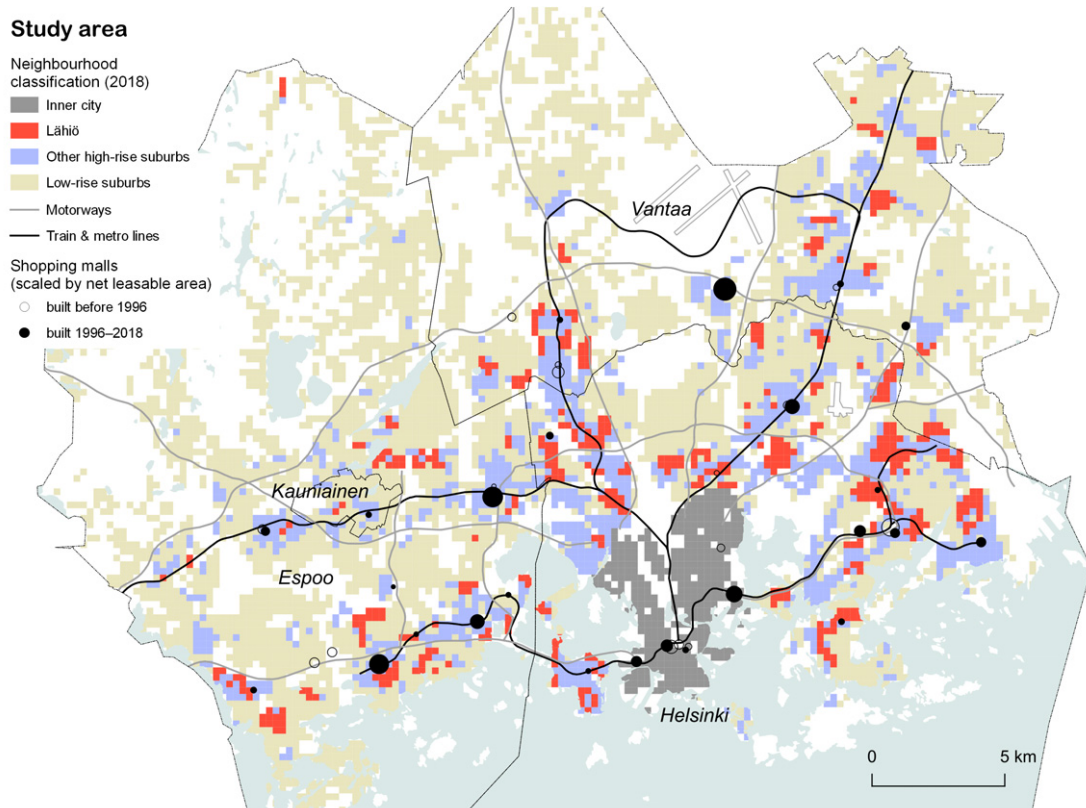


Figure 1

The study area, neighbourhood types and shopping malls (Shopping mall data from Finnish Council of Shopping Centers).

The selection of service types was informed by previous studies on what residents consider as needed neighbourhood services in the Finnish *lähiö* context (Halme et al., 2001; Kytö et al., 2011). The selected service types were additionally determined to fulfil a function in people's everyday lives and could generally be considered as services provided within the neighbourhood, that is, they generally may be reached within a 15-minute walk from home (Elldér et al., 2018, 2022). These criteria exclude for example cultural institutions and higher education, as these are generally more centralised and available in fewer locations. The included service types, definitions and total counts are presented in Table 2.

Table 2. Service categories and descriptive statistics.

Service category	Industrial classification codes		Number of facilities	
	1996 (TOL 1995)	2018 (TOL 2008)	1996	2018
Pre-primary, primary education	80100	85100, 85200, 85311	303	289
Child day-care	85321	88911, 88919	864	978
Libraries	92510	91010	62	63
Health care centres	85121	86210	51	66
Grocery stores	52111, 52112	47111–47113	327	376
Specialised food stores	52210–52250, 52271–52279	47210–47250, 47291–47299	354	250
Other specialised stores	52320–52509	47410–47722, 47740–92, 47799	3093	2499
Restaurants, cafés and bars	55301–55303, 55400	56101–56103, 56301, 56302	1435	2445
Kiosks	52113	47114	364	207
Pharmacies	52310	47730	97	102
Private health care	85129	86210, 86220	121	318
Banks	65121	64190	180	133
Sports & fitness facilities	92610	93110, 93130	103	264
Petrol service stations	50501	47301	141	80
Department stores	52121–52129	47191–47199	46	61

The business register data includes all registered companies and their industrial classification codes (TOL codes) which were used to identify the different service types. As home and online businesses are also included, and indistinguishable from physical stores in the register, some manual filtering was required. It was deemed necessary in order to correct for inconsistencies between the datasets and to ensure that only intended facilities, and not for instance offices and warehouses, are included.

Small grocery stores² with less than two full-time equivalent employees, and department stores with less than four employees, were excluded in 2018 if their name did not indicate that they belong to one of the few grocery chains. This decision was made based on comparison with real-life observations from various parts of the study area. Only banks which offer daily bank services for private customers were included by manual verification.

Primary schools include all publicly and privately administered comprehensive schools, except for Swedish language schools which are excluded, as they serve mainly the small Swedish speaking population (6% of total population) which is not evenly distributed over the neighbourhoods. Duplicates have been removed where identified, however it is possible for one school to be registered separately for lower and higher grades.

Facilities registered as health care centres, but only offering specialised services such as dental or occupational health services, or maternity clinics, are excluded. Private health services with only one or fewer registered employees are also excluded. Only municipal libraries are included, excluding archives, library buses and administrative units.

Inconsistencies between the datasets over the study period prevented the inclusion of many types of public services, such as public sports halls, youth and community centres, and elderly care, which did not have complete information in 1996. We are thus unable to fully cover the offerings of the neighbourhood. Beyond the possibilities of this paper also lies the civic sector, such as sports clubs, scouts, and other leisure and voluntary organisations, which might play an important role in the social life and participation in the neighbourhood. We are also unable to track post services, as they are no longer provided in independent post offices.

2. TOL-code: 47113

Accessibility analysis

We measure accessibility to services by proximity, within a 1-kilometre Euclidian radius of a resident's home (referred to as neighbourhood). The number of services within each category, as well as the neighbourhood's population and workplaces, has been calculated within this 1-kilometre buffer using QGIS software (count points in polygon). For regional-level analysis, this has been done from the 250 m grid cell centroids. In the *lähiö*-level analysis, the neighbourhood calculations are done from each residential building, and then aggregated (population-weighted) to the *lähiö* polygons.

The choice of 1 kilometre represents an approximate 15-minute walk (Shearer et al., 2015) and is commonly reported in surveys as the distance that people do and are willing to walk (Lee & Moudon, 2006), including *lähiö* residents (Kytö et al., 2011). Different opinions however exist (Gunn et al., 2017), for instance, in the early years of *lähiö* construction, Uusitalo (1967) showed that the use of local services decreased rapidly with walking distance, 400 metres being the threshold for how far people are willing to walk for everyday shopping.

Statistical analysis

Our analysis proceeds in three steps. First, we compare the mean number of service locations within different neighbourhood types. Second, we use population-weighted linear regression models to examine how different population and urban structure variables are connected to the number of services within residents' 1-kilometre neighbourhoods in years 1996 and 2018, at the regional level. Third, we identify differences among the *lähiös*.

The explanatory variables in the regression are: 1) the residential population and workplaces counts in the 1-kilometre neighbourhood, 2) the natural logarithm of the distance to Helsinki city centre and to the closest metro or train station (calculated from grid cell centroids), 3) the neighbourhood's socioeconomic score, 4) the grid cell's neighbourhood type (dummy variables), and 5) the proportion of housing built within the previous ten years in the neighbourhood. The socioeconomic score is a measure of socioeconomic disadvantage in the neighbourhood and is the sum of the (standardised) proportion of residents with a low income, residents with only basic education, and the unemployment rate within the 1-kilometre neighbourhood ($\alpha=0.81$). Distances to the city centre (central railway station), and metro and train stations were calculated along the road network, in QGIS version 3.16.2 using the QNEAT3 plugin. The regression models were first run separately for each service type in order to detect service type-specific patterns. As municipal services and commercial services were found to follow similar locational strategies respectively, we simplified the analysis by creating two variables expressing the standardised average of accessible municipal and commercial services within the 1-kilometre neighbourhood.

To identify differences in service accessibility across *lähiö* neighbourhoods, we use the results of the regression analysis to inform the grouping of *lähiö* areas into three groups using k-means clustering. The average service profile of these groups is calculated to determine how differentiated their service accessibility and trajectories have been.

Results

Over the study period, the absolute number of most service types predictably increased along with the population growth, with a few notable exceptions (Table 2). Schools decreased slightly in number; however, this is due in part to the administrative mergers of some lower- and higher comprehensive schools during the study period, which has the effect of reducing the number of registered schools. Comparison of the number of schools

between neighbourhoods or over time is thus not reliable. Specialised food and retail stores decreased, along with kiosks, banks and petrol service stations. The transition to digital banking is clearly witnessed during this period. On the other hand, the number of restaurants, cafés and bars increased by over 70 percent, partly due to increasing liberalisation of the sector. These patterns are quite visible also when looking at local accessibility within the neighbourhood.

Regional patterns

Residents of *lähiö* areas have on average as good access to local public services as the residents of other high-rise suburbs, and over the study period, the number of accessible facilities within 1 kilometre did not change markedly (Table 3). On the other hand, *lähiö* residents have access to considerably fewer commercial services. As expected, the biggest changes are in the number of specialised stores that have decreased, and restaurants that have increased. Those services which are regulated to control numbers and distribution, such as pharmacies, are seen to be quite consistent over the period. The general trajectory over time does not differ greatly between the *lähiö* and other neighbourhood types.

Table 3. Mean number of service locations accessible within 1 km.

	INNER CITY			LÄHIÖ			OTHER HIGH-RISE SUBURBS			LOW-RISE SUBURBS		
	1996	2018	change	1996	2018	change	1996	2018	change	1996	2018	change
Primary school	6.6	4.5	-31 %	3.7	2.6	-29 %	4.0	2.7	-32 %	2.3	1.8	-20 %
Childcare	22.4	15.4	-31 %	10.1	9.0	-11 %	10.5	10.3	-1 %	5.7	6.3	11 %
Public library	1.2	1.4	11 %	0.8	0.8	-7 %	0.8	0.7	-15 %	0.4	0.4	-17 %
Public health care station	1.4	1.0	-31 %	0.7	0.8	15 %	0.7	0.9	30 %	0.3	0.4	33 %
Grocery store	14.0	15.1	8 %	3.7	3.5	-5 %	3.6	3.5	-2 %	1.6	1.7	8 %
Specialised food stores	25.9	13.4	-48 %	2.1	2.1	-1 %	3.0	2.3	-22 %	1.2	0.8	-29 %
Other specialised stores	225.9	142.8	-37 %	17.6	14.5	-18 %	27.7	21.6	-22 %	10.9	7.6	-30 %
Restaurant, café, bars	99.0	153.4	55 %	9.1	16.1	76 %	12.2	19.1	57 %	4.7	7.0	50 %
Kiosk	17.9	7.6	-58 %	3.3	2.1	-38 %	4.0	2.3	-43 %	1.6	0.8	-50 %
Pharmacy	5.2	4.3	-18 %	1.0	1.1	8 %	1.0	1.4	32 %	0.4	0.3	-15 %
Private health care	9.9	17.5	76 %	0.4	1.5	263 %	1.2	2.6	128 %	0.3	1.2	330 %
Bank	10.5	9.0	-14 %	1.4	0.7	-49 %	2.1	1.6	-23 %	0.6	0.3	-53 %
Private sports facility	3.6	7.8	121 %	0.7	2.0	211 %	1.2	2.6	125 %	0.5	1.3	155 %
Petrol service station	2.4	1.5	-38 %	1.2	0.9	-28 %	1.3	0.8	-44 %	0.8	0.4	-45 %
Department stores	2.0	1.1	-46 %	0.5	0.5	2 %	0.8	1.0	20 %	0.2	0.2	-10 %
<i>Population total</i>	<i>167 132</i>	<i>205 249</i>	<i>23 %</i>	<i>195 339</i>	<i>198 240</i>	<i>1 %</i>	<i>278 360</i>	<i>430 708</i>	<i>55 %</i>	<i>292 820</i>	<i>327 432</i>	<i>12 %</i>
Area (km ²)	21.9	22.9	5 %	30.8	30.8	0 %	54.7	75.3	38 %	291.3	281.4	-3 %
Inhabitants/km ²	7 619	8 948	17 %	6 352	6 447	1 %	5 090	5 719	12 %	1 005	1 163	16 %
<i>Population 1 km</i>	<i>20 862</i>	<i>24 347</i>	<i>17 %</i>	<i>9 432</i>	<i>11 249</i>	<i>19 %</i>	<i>9 714</i>	<i>11 377</i>	<i>17 %</i>	<i>5 604</i>	<i>6 552</i>	<i>17 %</i>
Low education (%)	26 %	14 %	-46 %	37 %	29 %	-22 %	33 %	25 %	-24 %	26 %	16 %	-38 %
Low income (%)	15 %	17 %	13 %	15 %	20 %	33 %	15 %	18 %	20 %	12 %	14 %	17 %
Unemployment (%)	7 %	7 %	0 %	9 %	12 %	33 %	9 %	10 %	11 %	5 %	5 %	0 %

We performed multiple linear regression models in order to examine which neighbourhood population and urban structural factors explain access to services locally. The results of the models are summarised in Table 4. Population and workplace densities in the 1-kilometre neighbourhood explain 60 percent of the variation in access to public services and 90 per-

cent to commercial services in 2018. Access to municipal services (school, childcare, library, health care station) is primarily associated with the population density of the neighbourhood, whereas workplace density predicts best the number of commercial services. Both municipal and commercial services are now more associated with workplace clusters.

Table 4. Regression models (standardized beta coefficients).

	MUNICIPAL SERVICES		COMMERCIAL SERVICES	
	1996	2018	1996	2018
Population (1km)	0.85	0.67	0.32	0.23
Workplaces (1km)	0.02	0.18	0.75	0.87
<i>Neighbourhood type</i>				
Low-rise suburban (=ref)
Lähiö	0.06	0.07	-0.01	-0.02
Other high-rise suburban	0.11	0.17	0.02	-0.01
Inner city	0.11	0.12	-0.06	-0.29
Socioeconomic score (1km)	0.03	0.03	-0.04	0.01
Proportion new apartments (10 years)	-0.04	-0.14	-0.01	-0.01
Distance to city centre (ln)	0.13	0.24	-0.01	-0.11
Distance to train/metro station (ln)	-0.07	-0.02	0.03	-0.01
<i>Adj. R²</i>	77 %	60 %	94 %	90 %
<i>N</i>	931 544	1 161 746	931 544	1 161 746

Note: All variables are significant at the 99.9% level.

Adding variables for neighbourhood type, socioeconomic score, proportion of new apartments, and distances to city centre and train/metro stations, to the models only increase their explanatory power by a few percentage points. When controlling for urban structural factors, service provision in *lähiö* areas does not differ from the rest of the region, and socioeconomic disadvantage is not related to the number of locally provided services. Newly built areas have, before controlling for other factors, slightly worse access to services than others: the proportion of apartments built within the last ten years explain 14 percent of the variance in number of services in 1996, and 7–10 percent in 2018, when there were less new residential areas.

Over time, the explanatory power of our models diminishes, particularly for the municipal services. The association of services with population density is now weaker, suggesting that as the HMA has grown, and population now is more dispersed within the region than before, particularly the municipal services have not followed the population to the same degree.

Differentiation of *lähiös*

Despite sharing many attributes and a common development timeline, there is much variance in the size, population, geographical location and connectivity of the *lähiö* areas within the urban structure of the region. Based on the regression analysis, the population density within the 1-kilometre neighbourhood explains most of the variance in number of services and service types that are accessible within the neighbourhood. To identify differences in the service accessibility across *lähiö* areas, the *lähiös* were grouped into three groups with k-means clustering based on the average population and number of service types accessible within 1 kilometre from the residents' homes ($R=0.753$). Distinctiveness of cluster means was confirmed with analysis of variance and Tukey's post hoc test.

The spatial order of the three *lähiö* groups does not follow the distance to the city centre; a

lack of services is not a feature only of neighbourhoods at the outskirts of the city (Figure 2). Neither does the scale, or geographical footprint, of the individual *lähiö* necessarily become a determining factor for services. Rather, in a polycentric city, it is the geographical location in relation to the major sub-centres (and shopping malls) that seems to matter. Thus, small housing estates at the outer urban ring may be part of a densely populated and well-served area, whilst small *lähiös* in seemingly central geographic locations may have poor access to services locally. Some of these smaller *lähiös* are affluent locations where the geography (e.g. island) restrains population growth and therefore the demand for services.

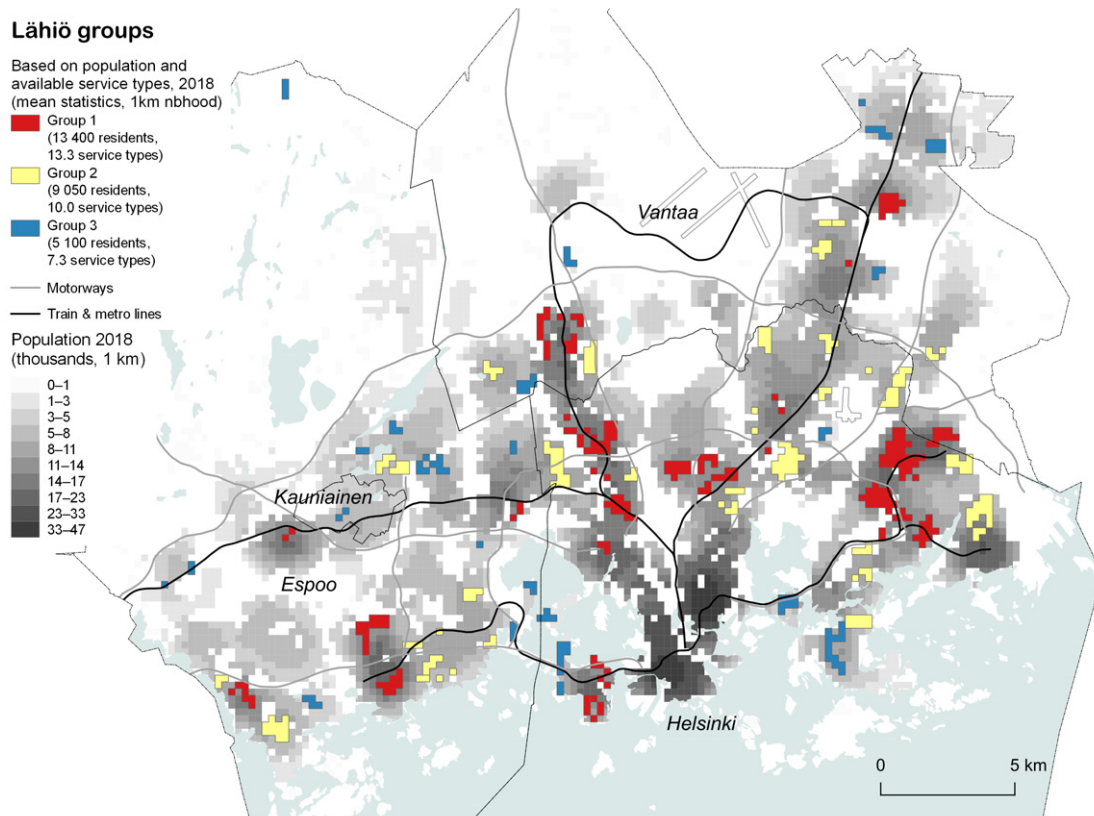


Figure 2

The *lähiö* areas in HMA grouped by population density and available service types (i.e. at least one of the service type within 1km).

The largest group of *lähiö* areas (group 1), where access to services is best, houses half of the region's *lähiö* population, and its residents have on average 13.3 of the 15 service types and on average 80 facilities available in their neighbourhood. In the second group, residents have access to 10 service types and 41 facilities, and in the third group, 7.3 service types and 24 facilities (Figure 1). Particularly for groups 2 and 3, the specific range of services may be somewhat different in different neighbourhoods, and these *lähiö* areas have seen decreases in both population and services. The greatest service increase within *lähiös* is in the number of restaurants, cafés and bars (+75%), a growth that is higher than the regional average (+52%).

Figure 3 shows the proportion of residents in each *lähiö* group that have access to at least one facility of the studied service types. The school and daycare centres are the backbone of services in the *lähiö*, present in almost all *lähiös* in HMA. Restaurants and some specialised stores are also accessible in all neighbourhoods, but in the more sparsely populated areas,

their number and accessibility is more limited. In group 1, residents have access to almost all service types, and the only service that has disappeared are banks. Libraries and health care stations are available in the neighbourhoods of half of the group 2 residents, but only for few in the smallest and most peripheral *lähios* (group 3). Access to services is fairly limited in these *lähios*, and has decreased notably for many service types: one third of the residents do not have a grocery store in their neighbourhood, and secondary local options for purchasing non-durable goods (kiosks, petrol service stations) have disappeared. Libraries, department stores and public health services are quite limited in number with only around 60 of each type in the entire region which accounts for their decreased presence in all three *lähio* groups.

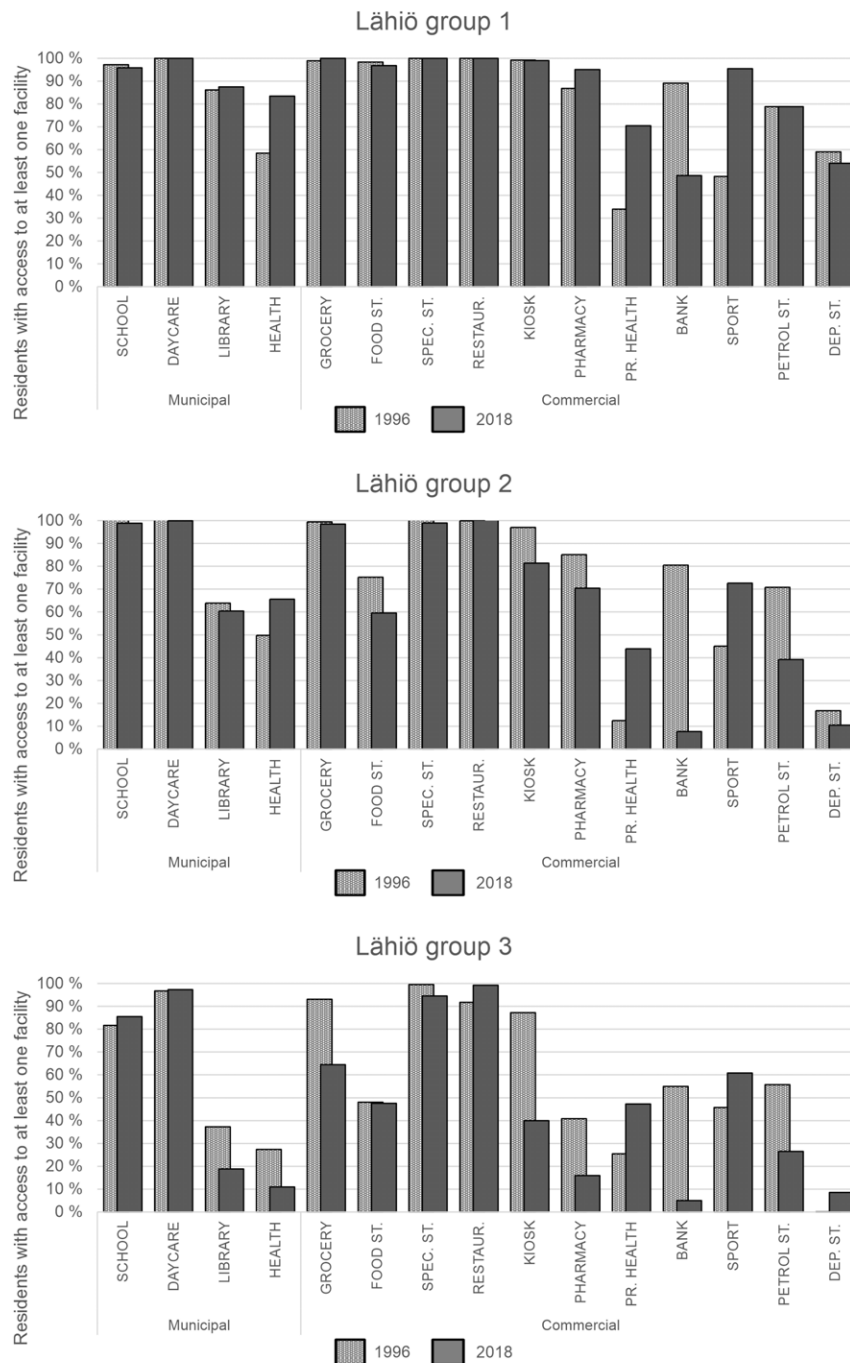


Figure 3

The proportion of residents in the three *lähio* groups with access to at least one facility of respective service type, for the years 1996 and 2018.

The socioeconomic composition of the *lähiös* follows a pattern similar to that found in the regression analysis: more densely populated and better served neighbourhoods (group 1) have more unemployed and lower educated residents, whereas the group 3 *lähiö* residents are somewhat more affluent (Table 5).

Table 5. Socioeconomic indicators of the three *lähiö* groups.

	2000			2018/2019		
	Group 1	Group 2	Group 3	Group 1	Group 2	Group 3
Low income ¹	15 %	13 %	15 %	20 %	19 %	22 %
Middle income	62 %	62 %	59 %	62 %	62 %	56 %
High income	23 %	25 %	26 %	19 %	19 %	21 %
Low education	38 %	38 %	32 %	30 %	29 %	25 %
Tertiary education	14 %	14 %	17 %	27 %	26 %	31 %
Unemployment	10 %	9 %	8 %	13 %	12 %	10 %

¹ Income: national quartiles (lowest and highest 20%, middle 60% of the population).

Discussion

In this paper, we set out to test the assumption that suburban housing estates are service-poor by comparison to other neighbourhoods in the Helsinki metropolitan area. With a comprehensive dataset covering all enterprises and establishments over a 22-year period, our aim was to explore how local service provision has evolved during a period of structural changes, digitalisation, and increasing urban socioeconomic segregation. As local services and social infrastructure have been found to be important for residents' health and well-being (Ellaway et al. 2009; Klinenberg, 2018), from a social equity perspective it is important that socio-economic status is not a determinant of access to local services and institutions.

Our paper contributes to the literature on post-war housing estates, which are at the centre of urban disadvantage in many European countries. Many studies mention the inadequate level of services and amenities as a common feature of housing estates (e.g., Hall, 1997; Dekker et al., 2005; Hess et al. 2018). Also in Finland, the lack of services in the post-war suburban housing estates, the *lähiös*, was considered a major problem (Ministry of the Environment, 1985)—real or imagined (Roivainen, 1999). However, empirical follow-ups, where neighbourhood services would have been identified and quantified, are rare.

Our findings support the fact that there is a general loss of some services (Culley, 2020), but do not suggest any significant service loss in the *lähiös* compared to other neighbourhoods in the metropolitan area. There are limited differences in the availability of services in the *lähiö* when other urban structural variables are controlled for. The relational position of the *lähiös* have remained quite similar since the mid-1990s. Whilst the number of some services have declined over time, this is not unique for the estates, but rather relate to structural changes on a larger scale. Some of the changes, such as the sharp decrease in specialised retail and banks, are related to changes in the retailing structure, whilst others appear to be related to changes in population, accessibility patterns and active land-use policies and redevelopment.

Essential services and facilities needed in everyday life can be accessed within 1 kilometre from one's home in most neighbourhoods; however, some decline is apparent in the smallest and most peripheral locations. Most *lähiö* residents have good access to basic services, but there are large variations in the availability of more specialised services (such as private sports facilities, specialised stores, and restaurants) between neighbourhoods. This result is

consistent with recent findings from Sweden: the most important services (schools, groceries) that are used daily are often accessible within walking distance, whereas more specialised services tend to appear in locations that are better reached by car than sustainable modes of transport from suburban settlements (Larsson et al., 2022).

The regression analysis showed a strong connection between residential population and workplace densities, and the number of services available. *Lähiös* do have somewhat fewer commercial services in their neighbourhoods compared with other high-rise suburbs, but not when controlling for their position in the urban structure. Many of the other high-rise suburbs are located in more recent transit oriented development locations, compared to the *lähiös* (Figure 1). The strengthened link between workplace clusters and services is a finding which appears consistent with the relentless construction of new shopping malls in the HMA during the study period, and the emerging trend to collocate public services with commercial services (City of Espoo, 2021). This finding would also point to the conclusion that places for shopping and other everyday activities are slowly shifting from being accessible by proximity towards being accessible by mobility, supporting private car-ownership. Living without a car in suburbia thus means worse opportunities to access a wide range of services, which may directly affect the most vulnerable groups in these neighbourhoods (Salonen et al., 2012).

The *lähiös* with the fewest services are generally of relatively small size, both in terms of geography and population. Many of these modestly serviced *lähiös* are also located at the fringes of the urban region, a central characteristic of the housing estates at the time of their construction (Wassenberg, 2018). However, some of the *lähiös* with the fewest services are also located quite close to the city centre nowadays. These areas may have too small of a local population or be located too close to existing service centres to be able to provide comprehensive services locally (cf. Ministry of the Environment, 1985).

From the perspective of social equity, our worry was that recent trajectories in the provision of many services might have mostly affected the socioeconomically weakest groups (which disproportionately live in the *lähiö*). Based on our analysis, and contrary to what has been previously suggested (Lankinen, 1998), residents with low socio-economic status do not, however, generally have worse access to local services than other population groups, in terms of the *number* of services. Socioeconomic disadvantage is overrepresented in densely populated locations (where access to services is better), whereas high earners are overrepresented in more sparsely populated low-rise areas, where a higher rate of car-ownership compensates for the longer distances. These findings are consistent with European literature on the topic, where it is argued that socioeconomically disadvantaged people need to choose their residence with more consideration for available local services, in order to compensate for mobility constraints (Bailey et al., 2015; Elldér et al., 2018; Macintyre et al., 2008).

Nevertheless, our results highlight the future need to consider the relative disadvantage of most vulnerable population groups in *lähiös*. Digitalization and the provision of many services in larger and more clustered units may intensify the service deprivation of groups with poorer access or skills to use different transportation systems and digital services (Church et al., 2000). Ethnic retail has contributed to the reshaping and revival of public space in some larger, immigrant-dense neighbourhoods (Hewidy & Lilius, 2022), but in most neighbourhoods, the access to a diverse range of specialised shops and kiosks has decreased. In addition to a loss of locally available resources (possibility to buy things), these facilities may have also acted as important social infrastructure sustaining public social life in the locality (Mehta & Bosson, 2010; Klinenberg, 2018).

Thus, the findings also highlight the role of the public sector particularly in disadvantaged neighbourhoods. If different commercial services disappear from more peripheral neighbourhoods, public institutions have a higher responsibility to maintain opportunities and social infrastructure in the neighbourhood. Schools, daycare and grocery stores stand out as key neighbourhood services, available to more than 9 out of 10 *lähiö* residents. Grocery stores cater for everyday consumption needs, whereas schools and daycare serve families with children. However, schools do play a wider role as a meeting place in the neighbourhood, connecting at least children and their parents to each other. Already in the neighbourhood unit concept (Perry, 1929), which also was the basis for Finnish *lähiö* planning, the school was intended to be the central place of each neighbourhood where residents would meet. Particularly in the case of more service-poor and disadvantaged neighbourhoods, where our study shows that schools are among the few services and institutions present, the potential of the school could be further developed (Bernelius & Huilla, 2021). This could mean utilizing the school facilities for such services that the city does not provide in the neighbourhood, such as libraries or health services, but also expanding their use for other leisure time activities for both children and adults.

An important limitation of our study is that we only consider the *number* and *type* of services in the neighbourhood. We cannot describe the qualitative aspects of services, including the size and range of stores, their quality and attractiveness (as well as their products and services), and their affordability to residents. This is an important topic for future research, as both private and public services may differentiate in their quality, even though the number of available service types remains constant. The quality of services—for example in the case of schools—may be an important factor shaping the future and well-being of the residents, as well as a factor in influencing future patterns of residential segregation (Bernelius et al. 2021). Additionally, as our analysis approach focusses on accessibility from an individual's perspective, we cannot answer questions about where or how services may be relocating and changes in other qualitative aspects of services. There is a need for further studies to understand the dynamics of any restructuration process in service and service providers' location strategies.

We have only analysed the *lähiös* in the Helsinki metropolitan area—a rapidly growing city-region where the population in and around many *lähiös* is again increasing, due to active infill policies. The situation in most middle-sized and smaller Finnish cities is the opposite (Stjernberg, 2019). The position of the *lähiö* in these cities are in many ways more peripheral, and with their shrinking populations it will be a challenge to keep services in these neighbourhoods. Further research should consider service provision in these shrinking cities.

Acknowledgements

This research received funding from the Finnish Ministry of Environment's Suburban Programme Lähiöohjelma for years 2020–2022 (Re:Urbia project).

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