

# Chapter 14

## Socio-spatial Disparities in Brussels and its Hinterland



Rafael Costa and Helga A. G. de Valk

**Abstract** Brussels' urban and suburban landscape has changed considerably since the 1980s. The consolidation of socioeconomic fractures inside the city, a reinforcement of long-lasting disparities between the city and its prosperous hinterland, as well as the increasing diversification of migration flows—both high- and low-skilled—contributed to these disparities. Recent evolutions of these patterns, however, have not been investigated yet and therefore remain unknown. Besides, the extent to which segregation is primarily related to economic inequalities and to migration flows—or a combination/interaction between the two—so far has not been studied. This chapter offers a detailed overview of the socio-spatial disparities in the Brussels Functional Urban Area. Our analyses relied on fine-grained spatial data, at the level of statistical sections and of individualised neighbourhoods built around 100 m x 100 m grids. We analysed socioeconomic segregation measures and patterns, as well as their evolution between 2001 and 2011. Socioeconomic groups were defined based on individuals' position with respect to national income deciles. In line with previous research, our results show very marked patterns of socioeconomic segregation in and around Brussels operating both at a larger regional scale and at the local level.

**Keywords** Brussels · Socioeconomic segregation · Inequality · Geocoded census data

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## 14.1 Introduction

Socioeconomic segregation, its origins and its consequences have attracted the attention of public policy and scientists alike. This also holds for Brussels, where the urban and suburban landscape has changed considerably since the 1980s with the consolidation of socioeconomic fractures inside the city, a reinforcement of long-lasting disparities between the city and its prosperous hinterland, as well as the increasing diversification of migration flows in terms of origin, occupations and socioeconomic position. Recent evolutions in these patterns, however, have not been investigated by the latest research and remain unknown. Besides, the extent to which segregation in Brussels is primarily related to economic inequalities and to migration flows—or a combination/interaction between them—so far remains unclear.

In this chapter, we provide a detailed overview of segregation patterns in Brussels and the hinterland and discuss whether and how these patterns can be linked to economic inequality and migration. We focus on the local level at Brussels' municipalities and the city's outskirts. This level of detail is needed as overall income inequality has remained relatively stable in Belgium over the past decades. Going beyond the national level and looking at processes of spatial inequality at a smaller, local-level scale can help us understand what is driving change or stability.

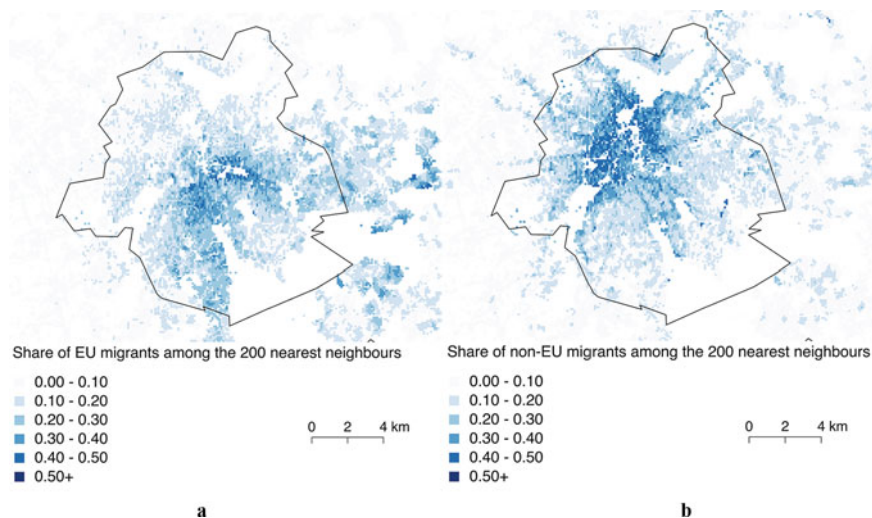
Our analyses are based on fine administrative units as well as individualised neighbourhoods. We first investigate socio-spatial inequalities in and around Brussels, in particular the residential segregation of high- and low-income groups. For this end, we rely on income data based on tax returns for 2001 and 2011 at the level of the statistical sections in the Brussels Functional Urban Area (FUA). We then concentrate on the deprived and affluent spots that have experienced the fastest improvements or deterioration of socioeconomic composition over the study period. This can help understand what is steering local-level disparities. The use of individualised neighbourhoods based on gridded data from the 2001 to 2011 Censuses allows us to take a closer look at these areas. Looking at socioeconomic segregation at a very detailed spatial level may shed new light on issues that remain unnoticed when taking a higher level of analyses.

## 14.2 Background

Brussels, such as other Belgian cities, is characterised by relatively high levels of socioeconomic segregation compared to other European cities (Musterd 2005). This is the result of both the specific migration history to the country and the housing policies in which homeownership is key. Housing policies in Belgium are characterised by a deregulated rental market, limited public housing and public policies focused on homeownership (De Decker 2008; Kesteloot and Cortie 1998). Social housing in Belgium in general and Brussels alike is limited and the public rental sector is not well developed. In fact, public housing accounts for only 8% of the housing stock in

Brussels, whereas one-third of the city's households meet the socioeconomic criteria to apply for social housing (Dessouroux et al. 2016). In turn, homeownership was and is seen as the preferred option for a family, whereas suburbanisation was facilitated by investments in commuting facilities. Stimulating homeownership resulted in large-scale suburbanisation and a decline of the inner-city neighbourhoods (De Decker 2008; Kesteloot and Van der Haegen 1997).

Suburbanisation was peaking in the 1960s, an economic boom time at which Belgium, like many other north-western European countries, started to recruit international migrants to fill in the ill-paid low skilled (mostly industrial) jobs (Kesteloot and Van der Haegen 1997; Kesteloot and Cortie 1998; Van Mol and de Valk 2016). These labour migrants mostly came from Italy, Spain, Greece, Morocco and Turkey, and they mainly settled in the central nineteenth-century neighbourhoods left behind by the Belgian middle-class (De Winter and Musterd 1998; Kesteloot and Van der Haegen 1997). Housing in these neighbourhoods was (and still is) characterised by cheap, low-quality dwellings that were part of the private rental market. Since then, migration from the mentioned countries continued, but other migrants, also from more affluent backgrounds, arrived in Brussels. These include a substantial share of European citizens coming to work in Brussels for the European and international organisations in the city (Corijn and Vloeberghs 2013; De Winter and Musterd 1998), mainly settling in the more affluent neighbourhoods of the city and the urban fringes. The different types of migration resulted in a spatial duality in Brussels. Figure 14.1 clearly shows how this is still the case today (Census 2011 data): migrants originating from European and those of non-European countries live in different parts of Brussels.



**Fig. 14.1** The spatial distribution of European and non-European migrants in Brussels (2011)  
*Source* Own calculations based on the Census 2011 (Statistics Belgium)

The reported duality was reinforced during the economic transition to a post-industrial economy after the 1970s, which led to a polarisation in terms of settlement and labour market into those with high- and low-skilled jobs. Similar to many European cities, new urban jobs in the post-industrial economy were mainly taken up by high-skilled workers, while the low-skilled urban populations had less opportunities in the labour market. In the case of Brussels, high-skilled jobs were filled especially by suburban commuters and international workers (De Winter and Musterd 1998; Corijn and Vloeberghs 2013). On the other hand, migrants of Turkish and Moroccan origin living in the city were among the groups that suffered most from the urban economic changes. Upward mobility was most difficult for these groups not only due to their low education level but also because they are more likely to face discrimination in the labour market (Rea 2013) as well as in the housing market (Verstraete and Verhaeghe 2019). As such, they were forced to stay in the neighbourhoods where they had initially settled (Kesteloot and Cortie 1998). Research has shown that also to date, newly arrived migrants from non-European countries tend to settle in the same central deprived neighbourhoods, where the housing stock is older and cheaper, where socioeconomic conditions are worse, and where a strong ethnic concentration prevails (Van Hamme et al. 2016; Costa and de Valk 2018). Moreover, due to the lack of public housing in Brussels (and the resulting long waiting lists), these migrants mainly have to rely on the private rental market with the lowest-quality housing stock, often located in inner-city neighbourhoods previously occupied by the industrial workers and earlier migrants.

More recently, Brussels' central neighbourhoods have experienced gentrification processes. Since the end of the twentieth century, Brussels has increasingly attracted young, well-off households composed of childless couples or isolated individuals, mainly highly educated and coming from other parts of Belgium and Western Europe (Van Criekingen 2010). Typically, these households only spend part of their early adulthood in Brussels before relocating to more prosperous areas: the city is thus a stage in their professional and family trajectories (Van Criekingen 2010). These households tend to establish themselves in inner neighbourhoods originally inhabited by low-income households (many from foreign origin), attracted by their central location and cheap rental prices (Van Hamme et al. 2016). The intense coming and going of such households has led to the reinvestment of certain inner neighbourhoods, with a housing offer increasingly targeted at higher-income earners and escalating rental prices—which is facilitated by the deregulated housing market (Van Criekingen 2010). There is, therefore, strong demographic pressure and increasing competition in the rental market in central areas that concentrate deprived households and ethnic minorities. Whereas long-distance displacement of these groups is still limited (Van Criekingen 2009), some low-income households have been pushed to adjacent poor neighbourhoods (Van Criekingen 2008; Van Hamme et al. 2016). But other households find themselves trapped in their neighbourhoods and experience a deterioration of their housing conditions, ending up in lower-quality or overcrowded dwellings (Van Criekingen 2010). At the city level, these gentrification processes in Brussels' inner neighbourhoods may appear as a rise in the social mix since young

professionals share the space with low-income households, but at the local level, they certainly contribute to socio-spatial disparities.

In sum, segregation patterns in Brussels were shaped by urban economic transitions—similar to many other Western cities—combined with specific housing policies and migration background in Belgium. As a result, Brussels is marked by important socio-spatial inequalities inside the city as well as in respect to the hinterland.

In the more recent period, the persistent levels of socioeconomic segregation in European cities have been ascribed to the rise in income inequality produced by economic liberalisation since the 1980s and subsequent economic crises (Marcinczak et al. 2015). However, it is unclear to what extent this also holds for Brussels, as income distribution seems to have remained rather stable in Belgium over the last decades.

Belgium is among the countries with a relatively low level of income inequality worldwide, close to (or even lower than) the Scandinavian countries. The Gini coefficient for disposable income remained stable over time and varied between 30 and 26 in the time period 1995–2017, with even a recent downward trend between 2000 and 2017 (EU-SILC data via Eurostat 2019). In addition, Belgium was the only country in Europe in which the share of the national income captured by the top 10% earners did not increase since the 1980s (Blanchet et al. 2019; Decoster et al. 2017). The few existing studies suggest that, contrary to many other countries, economic liberalisation over the last decades and the economic crises of 1998 and 2008 did not increase overall income inequality in Belgium. This is believed to be due to institutional factors, namely a rigid system that regulates salaries and labour, as well as the importance of the trade unions (Valenduc 2017).

Compared to the national level, income inequality is higher in Brussels, as is the case for most large cities. For comparison, Brussels had a Gini coefficient of 36 in 2013, at a similar level as Paris, and slightly higher than the Scandinavian capitals (OECD 2019). It is unclear, however, how the income distribution evolved over the last decades. On the one hand, the protective systems regulating salaries and labour also hold for Brussels, and they would have prevented inequalities from rising in Brussels as well. On the other hand, it has been shown that the Brussels population in the lowest income decile has been losing purchasing power since the 1980s at a higher rate than the other income deciles (Kesteloot and Loopmans 2009). Furthermore, it is unclear to what extent changes observed in segregation are linked to changes in income distribution.

In the remainder of this chapter, we aim to produce a detailed update of the recent trends in segregation in Brussels and its hinterland. In addition, we look into how these trends are related to income inequalities and what other factors may be at play.

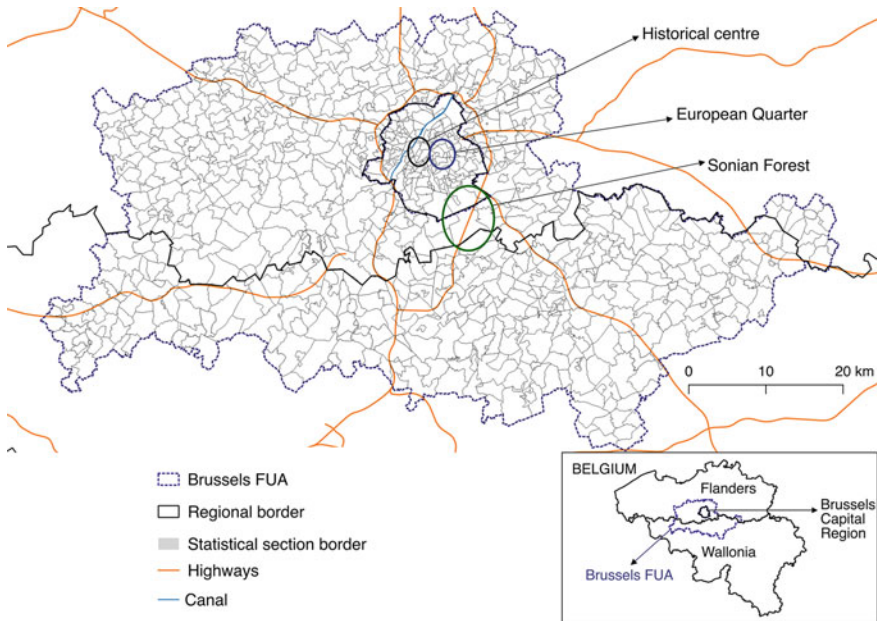


Fig. 14.2 The Brussels functional urban area

## 14.3 Space, Data and Methods

### 14.3.1 *Space Delimitation and Spatial Units*

We focus on the Brussels Functional Urban Area, as defined by the OECD (Fig. 14.2). This area covers a large surface encompassing 10% of the Belgian territory and making up for 23% of the country's population (2,531,106 inhabitants in 2011). It extends over the three administrative Regions of Belgium—Flanders, Wallonia and the Brussels Capital Region<sup>1</sup>—including French-speaking, Dutch-speaking and bilingual zones, and is marked by a highly diverse population in terms of culture and origin. In our analyses, we make use of two types of spatial units: administrative units and individualised neighbourhoods constructed around geocoded grids.

The administrative units chosen for this study are the 'statistical sections' (Fig. 14.2), which are intermediate units between the very small statistical sectors (or

<sup>1</sup>The Brussels-Capital Region is, in fact, one of the three administrative regions in Belgium. It is composed of 19 municipalities, among which is the City of Brussels. Throughout the text we do not make any reference to these municipalities or the City of Brussels; we refer to the Brussels-Capital Region simply as 'Brussels' or 'city'.

wards)<sup>2</sup> and the broader municipalities. The Brussels FUA contains 1,069 sections; from these, 180 were dropped due to the small number of inhabitants (<200 in 2001) in order to avoid random fluctuations. In the remaining 874 sections, the number of residents in 2011 ranged from 222 to 27,217 (average = 2,879; median = 1,546). In addition to sections, we use a nearest-neighbours approach in order to zoom in on the Brussels FUA. This approach implies that we start from geocoded individual data instead of areal units and use these data to construct individualised neighbourhoods with 200 nearest neighbours. These are fine-scale units that are independent of administrative borders (Fig. 14.1). The individualised neighbourhoods were constructed by dividing the territory into grids of 100 m by 100 m (resulting in a total number of 79,588 grid cells in the FUA). We then used geocoded individual data to identify the population aged 25–64 inside each grid by their x–y coordinates. Individualised neighbourhoods were constructed for each grid with the EquiPop software (see Östh et al. 2015). This software adds up adjacent grid cells until it reaches the 200 nearest neighbours. If a given grid cell has more than 200 individuals (due, for instance, to the presence of apartment blocks), the software does not add up adjacent cells. Most of the resulting individualised neighbourhoods have around 200 working-age individuals, except for a few outliers.<sup>3</sup>

### 14.3.2 Data and Definitions

In Belgium, there are no complete data on the professional occupation. Such data are available from surveys but are not representative at a fine spatial level and are thus not suitable for our spatial analyses. Therefore, we use income data as an alternative measure of socioeconomic position. We start from an individual-level dataset containing individuals' position in national income deciles (obtained from tax returns). This dataset, based on the administrative census, contains all individuals residing in Belgium in 2011. Null incomes were excluded from our analyses as they comprise many international employees who do not pay income taxes in Belgium or accompanying spouses with no own income. Excluding them is necessary as otherwise, they would falsely appear in the statistics as being poor. After the exclusion of null incomes, we computed the proportion of sections' population aged 25–64 in each income decile in 2011. Note that the dataset contains individual income and not household income. This is a limitation because high- and low-income earners in the same household are counted separately, as if they were neighbours of different income levels.

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<sup>2</sup>We chose not to work with the statistical sectors—which are the smallest spatial units available—because they are often too small: the median population of sectors in 2011 was only 429, whereas one-third of sectors had less than 200 inhabitants.

<sup>3</sup>The active population in individualised neighbourhoods range from 200 to 1,094, with a median of 205; 99% of these neighbourhoods have less than 315 inhabitants. Of note, in the computation of individualised neighbourhoods together with Statistics Belgium, we did not keep the original grids' population (prior to the aggregation of adjacent grids) for privacy reasons.



**Table 14.1** Missing individuals by age group in 2001 and 2011 (%)

	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	Total 25–64
2001	25.88	19.41	13.15	9.55	7.13	5.14	4.68	3.77	12.52
2011	1.89	1.77	1.26	0.83	0.48	0.37	0.21	0.12	0.91

Source Own calculations based on tax returns data (IPCAL database) and censuses 2001 and 2011 (Statistics Belgium)

The individual-level dataset also contains past income deciles for individuals who lived in the same place in previous years. Using this information, we computed the share of sections' population aged 25–64 by income decile in 2001 as well. However, information is missing for a considerable number of individuals who lived elsewhere in 2001 (Table 14.1), and this concerns especially the young age groups who are more mobile. Besides, the dataset does not include individuals who were present in 2001 and not in 2011 (i.e. who emigrated or died). Hence, our income data at the section level for 2001 is incomplete and results for that year must be interpreted with caution. In particular, it is important to keep in mind that results for 2001 concern an older and less mobile population, and because of the absence of individuals in the early stage of their career, lower-income groups are likely to be underrepresented.

We defined three income groups as follows. The *high-income* group is composed of the working-age persons in the three highest deciles of national income (8th through 10th); the *low-income* group is composed of those in the three lowest deciles (1st through 3rd); and the *middle-income* group consists of the remaining deciles (4th through 7th). We also refer to *highest-* and *lowest-income* groups as the 10th and the 1st deciles, respectively. Figure 14.3 shows the distribution of the Brussels FUA's population by income groups and deciles. Income groups and deciles are based on the national income distribution, not the FUA's. This means that if income distribution in the FUA were identical to that at the national level, we would have 10% of the active population in each decile, and 30%, 40% and 30% in the high-, middle- and low-income groups, respectively. In 2011, high- and low-income groups comprised 40% and 25% of the FUA's population, respectively. Hence, high-income groups are over-represented in the Brussels FUA, while low-income groups are under-represented.

The distribution of the active population into income groups and deciles varied very little between 2001 and 2011. As expected, the low-income group was smaller in 2001 due to the absence of young, low-earner individuals; however, the difference is very small (only 2% points). This is reassuring for the comparison between 2001 and 2011.

At the level of individualised neighbourhoods, we had access to four indicators that refer to the 200 nearest neighbours for each 100 m × 100 grid: (i) *high education*: share of persons aged 25–64 with completed tertiary education (2001 and 2011); (ii) *employment*: share of persons aged 25–64 in employment (2001 and 2011); (iii) *high income*: share of persons aged 25–64 with income in the 10th decile (2011); and (iv) *poverty*: share of persons aged 25 and above with income below 60% of the national median income (2011).



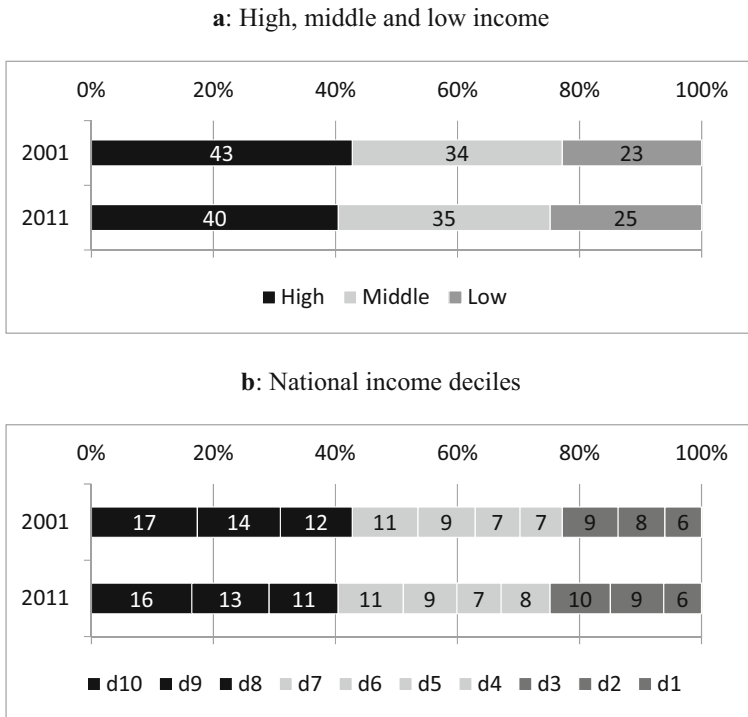


Fig. 14.3 Distribution of the Brussels FUA's active population by income group

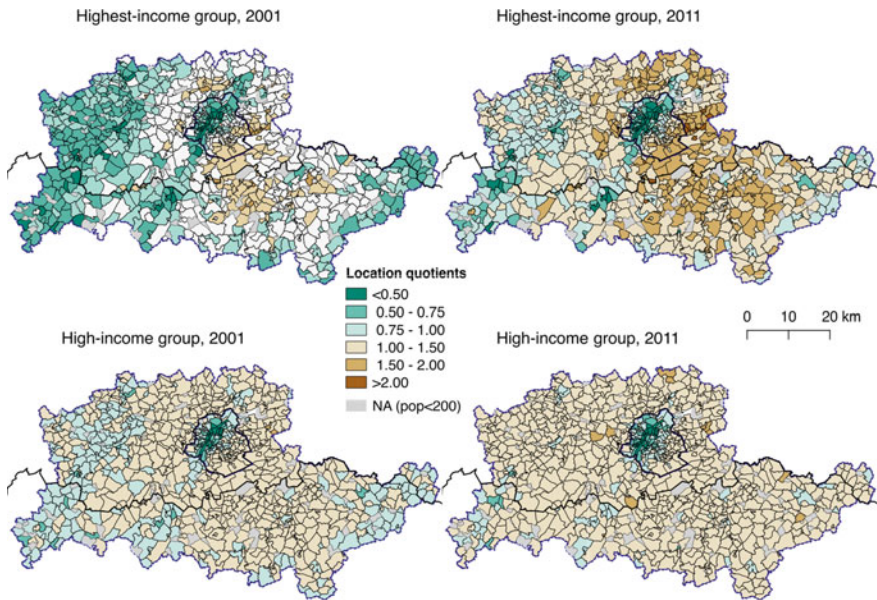
### 14.3.3 Methods

We first focus on the statistical section level to assess segregation patterns using the same techniques as in the other chapters of this book (i.e. location quotients, socioeconomic classification of neighbourhoods, location of high-income earners and dissimilarity indices). Next, we go to a finer level using individualised neighbourhoods based on grid data. We locate the spots where change is happening faster since 2001, that is, affluent and deprived spots that have concentrated more affluent and deprived people between 2001 and 2011.

## 14.4 Findings

### 14.4.1 Location Quotients

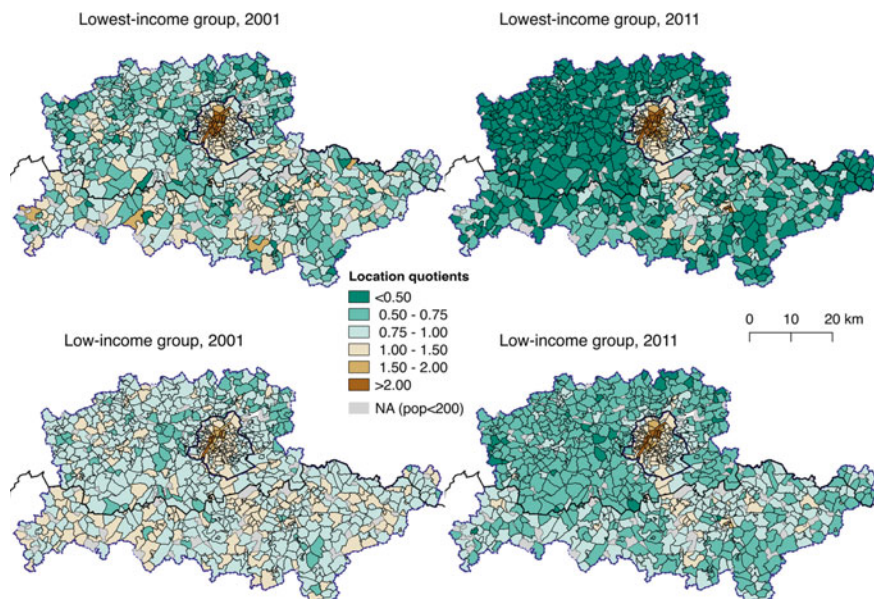
Segregation in the Brussels FUA mirrors very marked spatial disparities, both inside the city and between the city and the hinterland. These spatial disparities can be



**Fig. 14.4** Location quotients the highest-income group (10th decile) and high-income group (8th through 10th deciles), 2001 (left) and 2011 (right)

observed on the maps of location quotients (LQ) for selected income groups in 2001 and 2011 at the section level (Figs. 14.4 and 14.5). The maps report LQs for high- and low-income groups as well as for the highest and lowest income deciles separately. Income groups are underrepresented in the sections depicted in shades of green, and they are overrepresented in sections depicted in shades of brown. The maps reveal marked spatial patterns of segregation. The most obvious pattern is the central zone located north-east of the Brussels historical centre, known as the ‘Poor Croissant’. It has the highest concentration of low-income earners and the lowest concentration of high-income earners. This zone stretches along the canal in the nineteenth-century working-class neighbourhoods, which have been inhabited by deprived households since the last decades. Many of these households are of non-European origin (Fig. 14.1). In fact, these are very dense neighbourhoods: areas with  $LQ > 1.5$  of lowest-income decile in 2011 represent only 4% of the statistical sections, but they have 15% of the FUA’s population. High-income groups, in turn, have relatively lower LQ values; that is, affluent households seem to be more scattered in less dense areas. Finally, as we would expect, the spatial patterns are the clearest for the highest and lowest income groups.

Furthermore, there is a clear socioeconomic duality between the city and the hinterland. The concentrations of high-income groups are located in peripheral areas, in particular the zone extending south-east from the city centre and into the Flemish region. These are traditionally affluent neighbourhoods dominated by single-family dwellings and green zones. The duality between the city and the hinterland seems



**Fig. 14.5** Location quotients of the lowest-income group (1st decile) and low-income group (1st through 3rd deciles), 2001 (left) and 2011 (right)

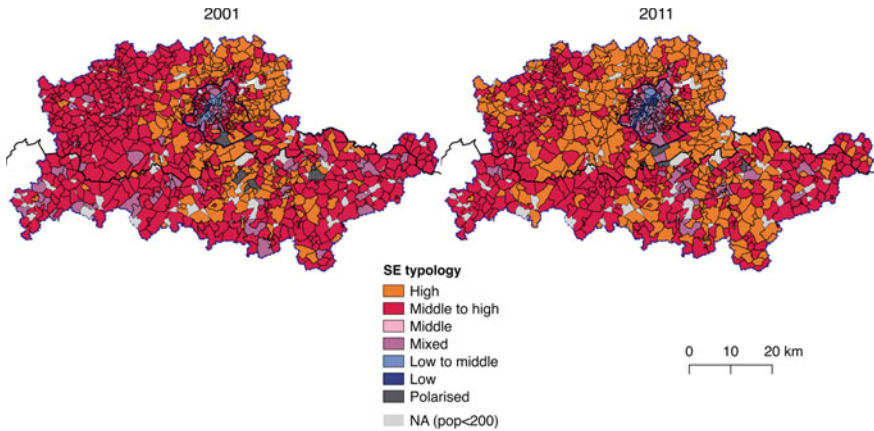
to have become more marked in 2011 compared to 2001, especially for the highest and lowest income groups.

#### 14.4.2 *Income Classification of Neighbourhoods*

The segregation patterns in the Brussels FUA are synthesised in the maps in Fig. 14.6, which depict the income classification of neighbourhoods<sup>4</sup> for 2001 and 2011. These maps are consistent with those observed for LQs: they show the duality between the city and the hinterland, with deprived neighbourhoods in central areas and affluent neighbourhoods in the suburbs.

In fact, the socioeconomic geography in 2011 follows a concentric pattern. Low-income earners are clustered in the area stretching along the canal, west from the city centre ('Low'). As we move away from this area, socioeconomic conditions improve. The immediate surroundings have a somewhat lower concentration of low income-earners ('Low to middle'), followed by a layer of neighbourhoods with mixed socioeconomic status. These mixed neighbourhoods extend over a large portion of the Brussels-Capital Region. They are followed by a layer of affluent neighbourhoods

<sup>4</sup>The income classification of neighbourhoods is based on the proportion of income groups in the sections. Income groups are those defined in Sect. 14.3.2. The neighbourhood types were obtained using the same criteria as elsewhere in this book.

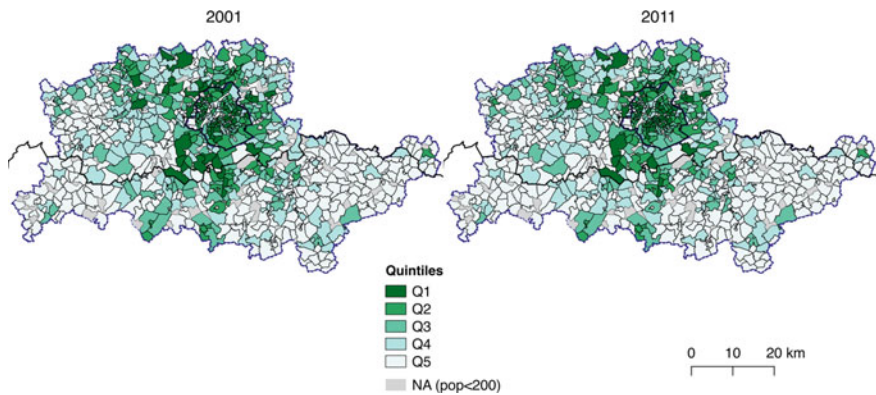


**Fig. 14.6** Socioeconomic classification of neighbourhoods in 2001 (left) and 2011 (right)

that surrounds the city. Finally, the rest of the Brussels FUA—further away from the city and its immediate surroundings—is marked by the presence of middle to high-income earners. These general patterns did not vary much between 2001 and 2011, although socioeconomic contrasts became more evident with the demarcation of extreme types (‘High’ and ‘Low’). Finally, it is interesting to notice that that ‘Middle SES’ neighbourhoods are all but inexistent in the Brussels FUA.

### 14.4.3 Location of High-Income Earners

As we have seen, the strongest clusters of high-income earners are located in peripheral neighbourhoods around the city, whereas the city itself is dominated by low-income and mixed neighbourhoods. However, this does not mean that the city has fewer high-income inhabitants compared to the hinterland. In fact, it is inside the city that we find the largest absolute numbers of high-income earners (Fig. 14.7). Many of the statistical sections in the first quintile of high-income inhabitants are located in the Brussels mixed neighbourhoods—particularly east from the canal area. This is due to the fact that Brussels is much more densely populated than the hinterland and high-income earners live mixed with or close to low- and middle-income earners. Between 2001 and 2011, the number of sections in the first quintile of high-income earners decreased from 50 to 46; this indicates that high-income earners became more concentrated. Moreover, high-income earners became more and more present in the European Quarter over the study period. These findings are in line with the influx of young high-earners (many from European origin) in Brussels’ central neighbourhoods, in particular, the historical centre and around the European Quarter (Van Crielingen 2010; Van Hamme et al. 2016; see Sect. 14.2 and Fig. 14.2).



**Fig. 14.7** Location of high-income earners (8th through 10th deciles) in 2001 (left) and 2011 (right)

### 14.4.4 Dissimilarity Indices

Table 14.2 presents dissimilarity indices (DI) between income groups and income deciles in 2001 and 2011. Not surprisingly, segregation is highest between top- and low-income groups. In 2011 the highest-income group (d10) was by far the most segregated from middle- and low-income groups. Due to the limitations in our data for 2001—namely the underrepresentation of young individuals—evolutions over the period must be interpreted with caution. Still, it is telling that DI values in the Brussels FUA increased substantially and consistently between income groups and between most income deciles. DI values for low-income groups increased by more than 70% over the period with respect to both middle- and high-income groups. However, this could be partly due to the structure of our data in which low-income

**Table 14.2** Dissimilarity indices (multiplied by 100) between income groups (top of the matrix: 2011; bottom: 2001)

	d10	d9	d8	d7	d6	d5	d4	d3	d2	d1	HIGH	MID	LOW
d10	13	20	19	25	30	35	39	40	42				
d9	9	10	9	14	19	24	28	29	33				
d8	15	10	7	8	12	16	20	21	25				
d7	12	8	10	9	14	19	23	25	30				
d6	15	10	9	7	7	11	16	18	25				
d5	16	11	8	8	6	7	11	13	22				
d4	20	15	11	12	9	7	7	10	20				
d3	23	17	12	15	12	10	6	7	18				
d2	23	18	12	17	14	12	10	8	12				
d1	27	24	18	24	23	22	22	19	14				
HIGH												16	28
MID											14		16
LOW											16	9	

groups were underrepresented in 2001. On the other hand, segregation between (the more reliable) high- and middle-income groups remained stable over the period.

If we look at income deciles, some interesting differences appear. DI scores for the highest income group (d10) increased by more than 50% in respect to deciles d1 through d7. Such substantial increases are also observed between higher-income deciles (d7 through d10) and middle- to low-income deciles (d5 through d3). The fact that DI became consistently higher, also among middle- and high-income deciles, suggests that there was indeed a rise in segregation from 2001 to 2011.

#### 14.4.5 *The Local Spots of Change*

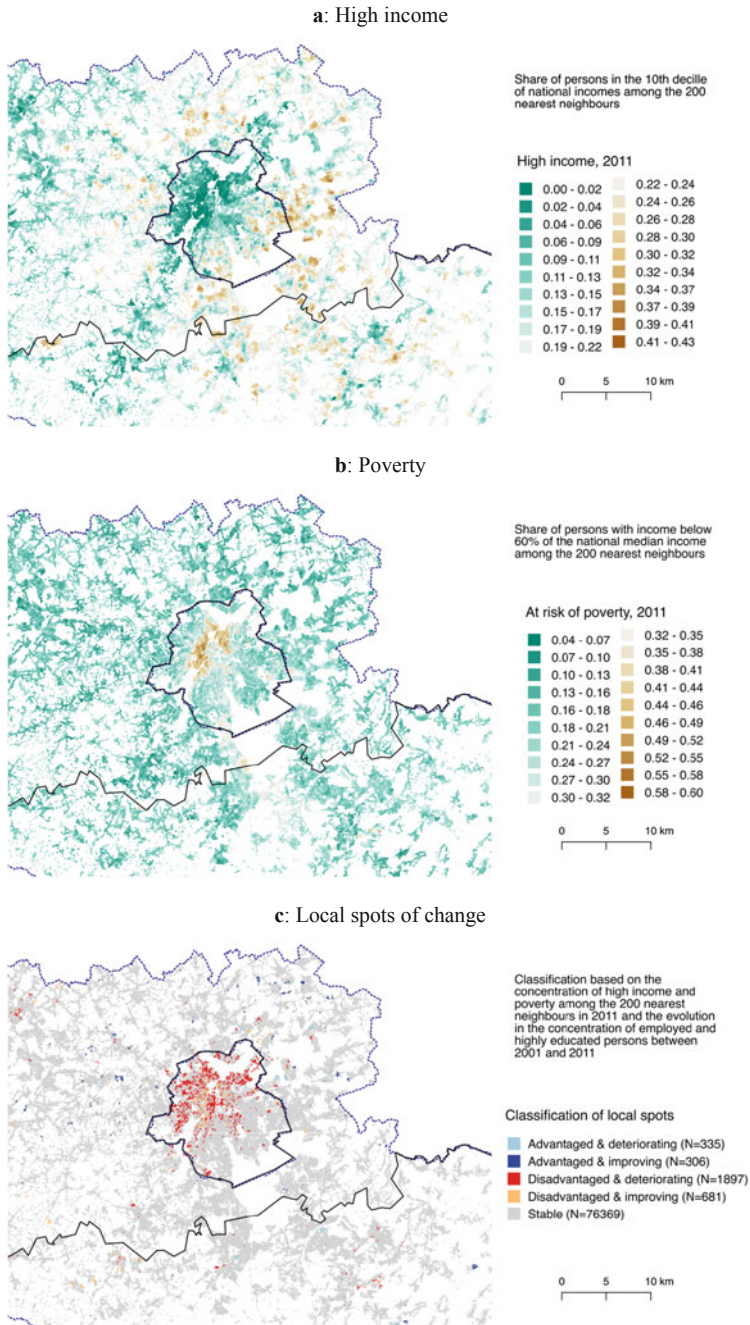
Next, we take a closer look at the socio-spatial disparities in the Brussels FUA using individualised neighbourhoods. These are built with a nearest-neighbours approach based on 100 m × 100 m grids (see Sect. 14.3). At this fine level of spatial detail, it is possible to locate the affluent and deprived spots where socioeconomic change is occurring more rapidly. In order to identify these spots, we use four indicators: the share of persons with *high income* (2011), the share of persons at risk of *poverty* (2011), the share of persons with *tertiary education* (2001 and 2011) and the share of persons in *employment* (2001 and 2011) among the 200 nearest neighbours (see Sect. 14.3.2).

Figure 14.8a, b depict the distribution of high income and poverty in 2011. The results are consistent with the findings at the statistical section level, yet they give a more nuanced and detailed picture of socio-spatial disparities in the Brussels FUA. These fine-grained measures are independent of administrative boundaries; furthermore, they allow the observation of the places that are actually inhabited. Poverty is highly clustered in dense central neighbourhoods: there is one contiguous zone around the historical city centre where the poor account for more than 40% of working-age residents and where high-income earners are all but absent. These are the old industrial neighbourhoods marked by bottom-quality dwellings from the private rental market; they are since long occupied by low-income households, many from the foreign origin (see Sect. 14.2). In contrast, clusters of high-income earners are scattered over populated areas, especially towards the southeast of the city, around the Sonian Forest.

We classified individualised neighbourhoods by a combination of two features: advantaged/disadvantaged and improving/deteriorating (Fig. 14.8c). An individualised neighbourhood is considered advantaged (disadvantaged) if high income in 2011 is in the top (bottom) quartile *and* poverty in 2011 is in the bottom (top) quartile. Moreover, a neighbourhood is considered to be improving (deteriorating) if the proportion change in tertiary education *and* employment between 2001 and 2011 is in the top (bottom) quartile.<sup>5</sup> For instance, a neighbourhood that is ‘advantaged &

<sup>5</sup>Tertiary education and employment are the only SES variable at our disposal in 2001 and 2011. Tertiary education in 2011 is highly correlated with high incomes ( $r = 0.83$ ) and in a lesser extent





**Fig. 14.8** Income distribution by the grid (individualised neighbourhoods)



improving' is *at the same time* among the highest shares of high incomes, the lowest shares of poverty, and the highest improvement in tertiary education and employment. All the individualised neighbourhoods that fall out of the four combinations of advantaged/disadvantaged and improving/deteriorating are considered 'stable'.

The resulting map (Fig. 14.8c) reveals interesting patterns. Disadvantaged spots (both improving and deteriorating) are much more frequent than advantaged ones and the vast majority of them are located within the city. Disadvantaged and deteriorating spots are by far the most frequent type and extend over contiguous zones in and around the city centre, but not in the most deprived neighbourhoods identified earlier. Instead, the most deprived neighbourhoods ('Poor Croissant') are marked by disadvantaged and improving spots. Although these neighbourhoods continue to concentrate the highest proportions of poor households, there seems to be a change in composition locally with an increase in highly educated inhabitants in employment. It is likely that gentrification contributes to these processes of improvement and deterioration of central areas. On the one hand, improvements in socioeconomic composition in the most deprived neighbourhoods may be stirred by new real estate projects in the canal area targeted at young, socially advantaged households; on the other hand, socioeconomic deterioration in adjacent poor neighbourhoods could be partially due to the arrival of low-income households pushed away from gentrified spots in the city centre, thus relocating to less-gentrified affordable neighbourhoods (Van Criekingen 2008; Van Hamme et al. 2016). In contrast to disadvantaged spots, advantaged spots are much less numerous and are scattered outside the city borders: these are isolated spots, each encompassing no more than (portions of) specific streets in wealthy neighbourhoods. In sum, there is a certain stability in wealthy neighbourhoods, whereas change—both improvement and deterioration—is happening faster inside the city among the already deprived neighbourhoods.

Between 2001 and 2011, there was a substantial change in the migration background in deteriorating spots. The average proportion of non-European migrants halved over the period in 'disadvantaged and improving' spots (from 14.2 to 7%), while it doubled in 'disadvantaged and deteriorating' spots (from 13.4 to 24.5%). This could indicate that improving spots have attracted Belgian and European households, whereas low-income households of non-European origin have been moving away from gentrified spots towards other deprived neighbourhoods. Of note, the proportion of migrants is very small in the spots that are 'advantaged and improving' (less than 3%).

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with poverty ( $r = -0.33$ ). Employment is fairly correlated both with poverty ( $r = -0.59$ ) and tertiary education ( $r = 0.53$ ).

## 14.5 Discussion

This chapter offers an overview of the socio-spatial disparities in the Brussels Functional Urban Area. Our analyses relied on fine-grained data, at the level of statistical sections and of individualised neighbourhoods built around 100 m × 100 m grids. We analysed socioeconomic segregation patterns and levels in 2001 and 2011 with different methods and using data on income, education and employment. The analyses carried out here provide an update on the situation based on the latest available data and go beyond that of previous studies by using individualised neighbourhoods based on grid data. In line with previous research, our results show very marked and persistent patterns of socioeconomic segregation in and around Brussels, operating both at a larger geographic scale and at the local level.

At the large-scale level, there is a clear divide between deprived central neighbourhoods and prosperous outskirts. Low-income groups are highly clustered in dense neighbourhoods in and around the city centre. In fact, around 15% of the Brussels FUA total population lives in central neighbourhoods where the low-income group is overrepresented ( $LQ \geq 1.5$ ). In turn, high-income groups are more sparsely distributed in the south-east neighbourhoods of Brussels and across most of the hinterland. These large-scale patterns of segregation, with a poorer centre and prosperous suburbs, are typical in Belgium, also for other cities; they are due to specific long-term territorial processes and housing policies (see also Costa and de Valk 2018).

Below these large-scale disparities, segregation processes operate at the local level, especially inside the city. Low-income groups are highly clustered in the neighbourhoods around the historical centre—the so-called ‘Poor Croissant’. These are the old industrial neighbourhoods, with low-quality dwellings and which also concentrate a large share of migrants from non-European countries. Apart from these poor neighbourhoods, the largest portion of the city is composed of mixed neighbourhoods (with 25–50% of each low-, middle- and high-income group). Interestingly, these mixed neighbourhoods are home to the highest absolute numbers of high-income earners of the Brussels FUA. In contrast with their suburban counterparts, this urban elite share their space with the middle class. Finally, we also find clustering of high-income earners in the green south-east part of the city, where single-family dwellings are most frequent.

Due to limitations with regard to the data on income we have at hand, it is a bridge too far to decisively conclude that segregation levels increased between 2001 and 2011, although our analyses point in that direction. In all cases, our findings show the tenacity of the same patterns of segregation in Brussels over time. Moreover, below these persistent patterns, change seems to take place at the local level in the already deprived areas inside the city. Most of these areas have been deteriorating over time in terms of socioeconomic composition; but interestingly, the most deprived neighbourhoods from the Poor Croissant have improved over the study period.

Although we know that inequalities measured by the Gini coefficient at the national level remained stable, it is yet unclear whether income inequalities have

increased in the Brussels FUA over the last decades. Either way, it is unlikely that variations in income inequalities are the primary cause of the observed segregation patterns. Rather, the persistence of these patterns in Brussels may be driven by migration patterns influencing socio-spatial inequalities, as well as specific housing policies.

First, international migration may fuel the existing segregation patterns (Van Hamme et al. 2016). On the one hand, it is likely that many non-European migrants with a low socioeconomic position establish themselves in the most deprived neighbourhoods. Not only do these neighbourhoods offer affordable housing (albeit of low quality), they can also be an easier gateway to the city because of the existing ethnic networks as well as language (and commercial) facilities. In addition, discrimination in the housing market may limit the residential choices of non-European migrants and thus their access to other neighbourhoods (Verstraete and Verhaeghe 2019). Our results have shown, indeed, that the most deprived neighbourhoods are also those which concentrate the highest proportions of non-European migrants. On the other hand, newly arrived international professionals are likely to choose neighbourhoods with a high proportion of expats, especially those in the European Quarter. These neighbourhoods are close to many international institutions and also to the city centre. In addition, real estate agencies operating in expats networks often attract newcomers to these areas. This explanation is supported by our finding that there was an increase in the top-income group settling in the European Quarter since 2001. In sum, if newcomers establish themselves in the typical concentration neighbourhoods according to their socioeconomic position and transnational networks, their residential choices (or lack thereof) are likely to maintain and even reinforce the existing segregation patterns.

Second, internal migration can also contribute to the observed segregation patterns. Whereas low-income groups are often forced into deprived neighbourhoods, higher-income groups have the choice to live in well-off neighbourhoods. As our results suggest, the richest 10% are by far the most segregated group and are highly clustered in specific spots. In addition, Brussels' central neighbourhoods have increasingly attracted highly educated youngsters who spend a part of their early adulthood in the city, before moving to outer neighbourhoods (Van Criekingen 2010; Van Hamme et al. 2016). The constant renewal of these transient residents has led to reinvestment in central neighbourhoods and consequently to gentrification processes (Van Criekingen 2008, 2009). The increasing competition in the housing market and the resulting rise in rental prices have forced low-income households that stayed in these neighbourhoods into more precarious conditions, while many relocated to other central neighbourhoods with more affordable rentals. These processes are supported by our analysis of local spots of change: some spots in the most deprived neighbourhoods have improved their socioeconomic composition over time—likely due to the arrival of better-off young households—whereas many other central areas have deteriorated their socioeconomic composition—probably aided by the residential move of low-income households coming from gentrified neighbourhoods. All in all, these

selective residential moves might be contributing, at a large scale, to a greater socio-economic mix in Brussels as a whole, but at the same time, at the local level, they might be fuelling socio-spatial fractures in central neighbourhoods.

Third, the housing market and housing policies do not seem to be effective in reducing socio-spatial disparities, and may even reinforce them. Belgium is characterised by liberal housing policies with a deregulated rental market and a focus on homeownership (De Decker 2008). Deprived neighbourhoods are dominated by bottom-quality dwellings in the private rental market, whereas the affluent neighbourhoods are dominated by owner-occupied dwellings. At the same time, social and public housing remain marginal in Brussels and is way below the population needs, which results in long waiting lists (Dessouroux et al. 2016). More recently, it is likely that regional (neoliberal inspired) housing policies in Brussels have favoured the emergence of large real estate projects targeted to the young middle- and upper class (Decroly and Van Crielingen 2009). These projects are especially situated in the remaining available spaces in the canal area. This could explain our finding that in some deprived local spots in this area, socioeconomic composition has improved since 2001. Such local-level processes driven by liberal policies and private investments may increase and fuel local inequalities.

It is difficult to determine what ultimately drives socio-spatial inequalities at the local level. Local concentrations of socioeconomic groups can be easily altered by small changes, for example, in the housing stock and in population composition due to in- and out-migration or social mobility processes. Future research should make use of longitudinal micro-data linked with fine-grained spatial information in order to understand how individual mobility and migration background interact with the existing segregation patterns as well as how they act to reinforce or attenuate them over time. This type of detailed analyses is much needed and could help clarify the underlying causes of socioeconomic fractures and point to policy interventions that may counteract high socio-spatial disparities and its determinants in Brussels.

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