RESIDENTIAL CONCENTRATION OF NON-NATIONAL POPULATION SUBGROUPS AND POTENTIAL SOCIOECONOMIC VULNERABILITY IN A SOUTHERN ITALIAN URBAN CONTEXT

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Abstract. The spatial distribution of residential patterns has often been translated into profound and increasing segmentation of urban contexts, which frequently uncovered deep socioeconomic spatial inequalities. With modern cities as one of the main systems of stratification and fragmentation, the main aim of this article is to investigate the potential socioeconomic vulnerability and the spatial concentration of non-nationals in the city of Bari at the time of the last Census (2021) applying spatial methods to census trats as units of analyses and considering the top five foreign-nationality population subgroups there residing (Georgians, Bangladeshis, Albanians, Romanians and Chinese). Our results show that suburban areas in the city where the potential socioeconomic vulnerability is higher are not necessarily those in which groups non-nationals are over-represented, but interesting differences regarding specific groups of non-nationals emerge. Also, the territorial concentration of non-nationals respect to Italian residents tend to diverge not only across the space but also among subgroups of non-nationals. These findings might be relevant to inform knowledge-based policies dealing with the urban space, particularly those dealing with the distribution of socioeconomic vulnerability and ethnic concentration within and across the neighborhoods of the city.

1. Introduction

Contemporary cities are becoming one of the most significant mechanisms of socioeconomic stratification and fragmentation. Urban agglomerations have been progressively transformed producing the reconfiguration of both public areas and private living spaces. This highly complex dynamic has led to a growing heterogeneity of well differentiated spatial patterns of population subgroups in the cities. Therefore, the distribution of residential spaces has often been translated into deep spatial segmentation of urban contexts revealing profound socio-spatial inequalities.

Recent research shows that social segregation in European cities increased due to the substantial and consistent growth of immigration flows and the rise of socioeconomic inequalities (Andersen and van Kempen, 2003; Tammaru et al., 2016; Lymperopoulou and Finney, 2017).

Undoubtedly, socioeconomic and housing conditions of the urban placement and its surrounding places play a relevant role not only in the size of the foreign population settling there, but also in its spatial patterns of residential segregation (Marcińczak et al., 2021; Pisarevskaya et al., 2021). This is particularly true when residential segregation is understood in terms of the extent to which individuals from different groups of the population (in terms of socioeconomic status, ethnicity, etc.) inhabit and actively live different locations (Reardon and O'Sullivan, 2004).

The latest studies on this subject find a clear North-South hierarchy of urban areas in Europe within the context of growing multiculturalism and socioeconomic inequality. That is, southern urban areas holding higher levels of segregation are also those combining a weaker economy with higher degrees of social vulnerability (Benassi et al., 2020; Marcińczak et al., 2021; Benassi et al., 2022).

The objectives of this article are threefold. First, this article presents an approach to assess multiple socioeconomic vulnerability[1] -including sociodemographic, human capital, employment, and housing factors- across urban populations at a local scale. The method includes the construction of a composite index that use available indicators in different domains to define potential socioeconomic vulnerability of the residential population by census tracts at the time of the last Census (2021) from the information publicly provided by the Italian National Statistics Institute (ISTAT). This method is applied to the city of Bari, Apulia, to illustrate its usability for identifying hotspots of spatial inequalities, allowing to assess whether and where there is an uneven distribution of socioeconomic vulnerability of the population at a detailed intra-urban scale. Second, it attempts to identity the suburban geography of non-national groups in the city analyzing their spatial concentration patterns by computing and mapping Local Quotients (LQs) of residents holding a foreign nationality (non-nationals) respect to the Italian resident population. Third, measuring local spatial correlation through the estimation and interpretation of the local versions of bivariate Moran's I between the index of potential socioeconomic vulnerability and the LQs for each population subgroup considered. We focus the attention into the top five foreign-nationality population subgroups residing in Bari (Georgians, Bangladeshis, Albanians, Romanians and Chinese), which represent more than 69% of individuals holding a foreign citizenship living in the city.

Undoubtedly, results might serve as a relevant input for stakeholders and policymakers of the city to screen the extent of potential vulnerability at a very fine scale of territorial disaggregation and across national and non-national population subgroups. This is particularly important to support knowledge-based regeneration policies in disadvantaged neighborhoods.

[1] In this article we use the concept of vulnerability for the analysis of socioeconomic and ethnic disparities, and their spatial relations in the city at the sub-urban level. This concept is embraced within the broader category of inequality that most research on this subject develops.

2. Theoretical background and state of the art: a brief overview

Inequality is spatially organized, and its organization is a result of both spontaneously differences among individuals, families, and groups that manifest across space and deliberate attempts to organize the space to sustain or reinforce inequalities (Dreier et al., 2001; Galster and Sharkey, 2017). As stated by Van Kempen (2007) the undivided city is, simultaneously, a myth and a utopic ideal. Cities are divided when two situations combine, that is, if the social tissue is divided, often the urban space is also divided[2]. This division deals with the association between socioeconomic polarization and spatial segregation. But urban cities are not simply divided in two, they might by divided in many pieces (dual, triple or quartered city), with more or less connections between these pieces (Musterd and Ostendorf, 2012).

A large body of research has shown that cities are segregated along socioeconomic or ethnic lines (e.g. Musterd, 2005; Van Kempen, 2005; Bolt et al., 2008;). In general, these studies found that the socioeconomic distance between "the less advantage" and "the more advantage" tends to follow a specific spatial outcome, in terms of segregation, in which the first group is concentrated in certain parts of the city (e.g. Musterd, 2005; Van Kempen, 2005).

Research confirms the existence of the divided city model in EU countries (OECD, 2018; Benassi and Iglesias-Pascual, 2023) but some studies also show a multiple/plural city model characterised by a variety of situations (Tammaru et al., 2020).

In fact, the relationship between high levels of socioeconomic inequality and spatial segregation is not always straightforward. In fact, it has been also shown that not always pronounced socioeconomic inequalities translate into marked spatial distance of population subgroups within the city. One example is Lisbon, where localities with the highest mean earnings are also those holding the highest level of inequality (Carmo and Carvalho, 2013).

As stated previously, contemporary cities are increasingly polarized and fragmented, which emphasizes obstacles for the socioeconomic and territorial integration of foreigners in the host society (Leclerc, 2021). Simultaneously, the socioeconomic vulnerability of foreigners is expected to strongly influence their socio-territorial process of integration (Imeraj et al., 2020).

The concept of the dual/divided city has been frequently used to highlight the socio-economic inequalities in the cities (Castells and Mollenkopf, 1991) and to explain the polarized urban spaces (Fainstein, 1992).

[2] The following terms are frequently used as synonyms of divided cities (Fainstein et al. 1992), dual cities (Mollenkopf & Castells, 1991), polarised cities, fragmented cities and partitioned cities.

A specific strand of literature has framed the division of urban space within the context of socio-spatial segregation of large cities often measuring the differences between neighborhoods according to the resources of their residents (Maloutas and Spyrellis, 2019). This phenomenon has been investigated by different approaches mainly based on the perspective of social classes within large urban areas (Oberti and Préteceille, 2004) and on the ethno-racial differences in the occupation of urban space (Benassi et al., 2020; Yaho et al., 2019).

Recently, literature has been increasingly paying attention to the relationship between the initial socioeconomic vulnerability of the migrant populations and their socio-spatial integration (Imeraj et al., 2020). In particular, several studies highlight how the economic dimension and the ethnic and cultural background of migrants are reflected in the difficulty of accessing the residential market: process of socio-residential exclusion (Portes and Rumbaut, 2001).

Based on previous research, and considering the peculiarities of Southern urban contexts, we aim at answering following research questions:

- ✓ RQ1: Which is the degree of heterogeneity in the sub-urban distribution of potential socioeconomic vulnerability across the city?
- ✓ RQ2: Are there any differences in the territorial concentration of the first five non-national groups if compared to Italian residents?
- ✓ RQ3: Is there a spatial correlation between potential socioeconomic vulnerability and the territorial concentration of these non-national groups respect to Italians?

3. Data and methods

The empirical analyses performed in this article are based on the last available Census data for 2021 at the level of the census tracts of the city of Bari, which come from the information publicly provided by the Italian National Statistics Institute (ISTAT). More specifically, we rely on data regarding the age groups, nationalities, number of household members, level of education and non-employment status of resident population, that are merged to housing conditions drawn from the 2011 Census. We select census tracts having at least 10 residents (n=1,291) and we focus the attention on Georgians, Bangladeshis, Albanians, Romanians and Chinese, which together represent more than 69% of individuals holding a foreign citizenship living in the city.

To answer to our first research question (RQ1) we built a composite indicator to measure potential socioeconomic vulnerability using several items that cover three well differentiated dimensions. The first is sociodemographic and includes two indicators: the share of individuals over 70 among total population and the

percentage of households with more than four components among total households. The second dimension is socioeconomic and introduces measures of low human capital by gender, that is, the shares of male/female population with at most the first level of secondary education among total males/females; plus, non-employment measures by gender, specifically, the shares of not-employed males/females among total male/female population between 15 and 64 years old. The third dimension regards housing conditions incorporating the share of residential buildings in bad or very bad state of preservation among total residential buildings. We apply Principal Component Analysis (PCA) to reduce the former six indicators into three principal components (PCs) that account for 73% of data total observed variation. The resulting composite index was built up for each census tract with the PCs retained, weighted by their eigenvalues. Finally, the indicator was standardized using the min-max method to obtain a Composite Index of Potential Socioeconomic Vulnerability that varies between 0 (null potential vulnerability) and 1 (maximum potential vulnerability). The values of this index are represented in Figure 1 at the level of census tracts through a natural breaks (Jenks) map.

For the analysis of the spatial concentration patterns of non-national population subgroups (RQ2), we compute and map Local Quotients (LQs) as a ratio of ratios (Benassi and Iglesias-Pascual, 2023), where the first is the ratio between the total population of each non-national group divided by the total Italian population for the whole city, and the second regards the same numerator and denominator but it is computed for each census tract. When the LQ is minor than 1(LQ<1) the non-national group understudy is under-represented respect to Italians, instead, if the LQ is greater than 1(LQ>1) the specific non-national group is over-represented. The LQs of the top five groups are illustrated in Figure 2.

Finally, to respond to the third research question (RQ3), we estimate and map both the local versions of bivariate Moran's I between the Composite Index of Potential Socioeconomic Vulnerability and the obtained LQs for each one of the non-nationals' groups considered. We use the queen-based contiguity weights matrix and we map these results in Figure 3.

4. Results

4.1. The heterogeneity of Potential Socioeconomic Vulnerability

Figure 1 shows -using a natural breaks map- the suburban distribution of the Composite Index of Potential Socioeconomic Vulnerability in the city of Bari. According to the values that this figure illustrates, it is possible to clearly identify

significant differences across sub-municipality areas[3] regarding degrees of potential vulnerabilities. In the map, green spots represent census trats with lower levels of vulnerability, while red ones indicate those that are more potentially vulnerable in socioeconomic terms. We can also see that the representation of green and red spots follows a particular "island-type" spatial distribution. If we concentrate the attention in the red spots, the most vulnerable tracts of the city, emerges that sub-urban areas of high potential vulnerability are, simultaneously, spatially clustered and clustered-disperse. This might be interpreted as a very first sign indicating duality, given that the most vulnerable groups are spatially isolated not only in certain areas but also across several sub-municipalities of the city.

Figure 1 – *Composite Index of Potential Socioeconomic Vulnerability. Bari (2021).*

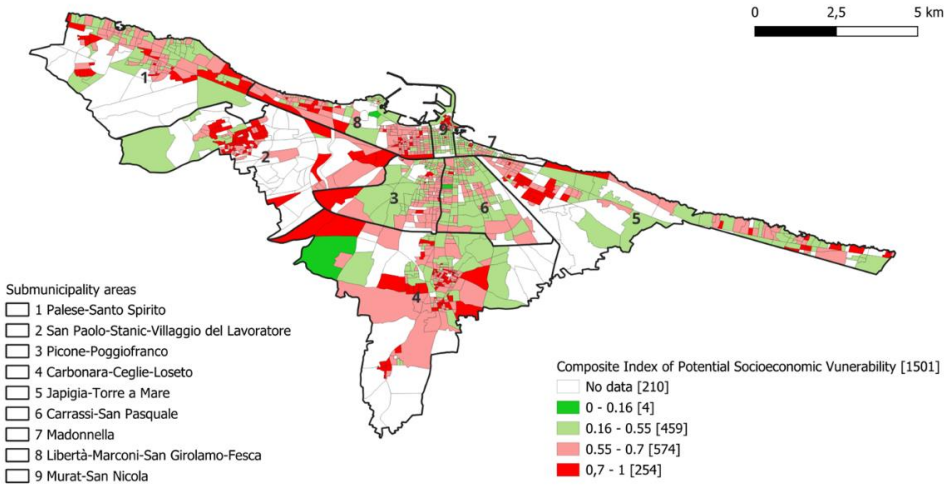


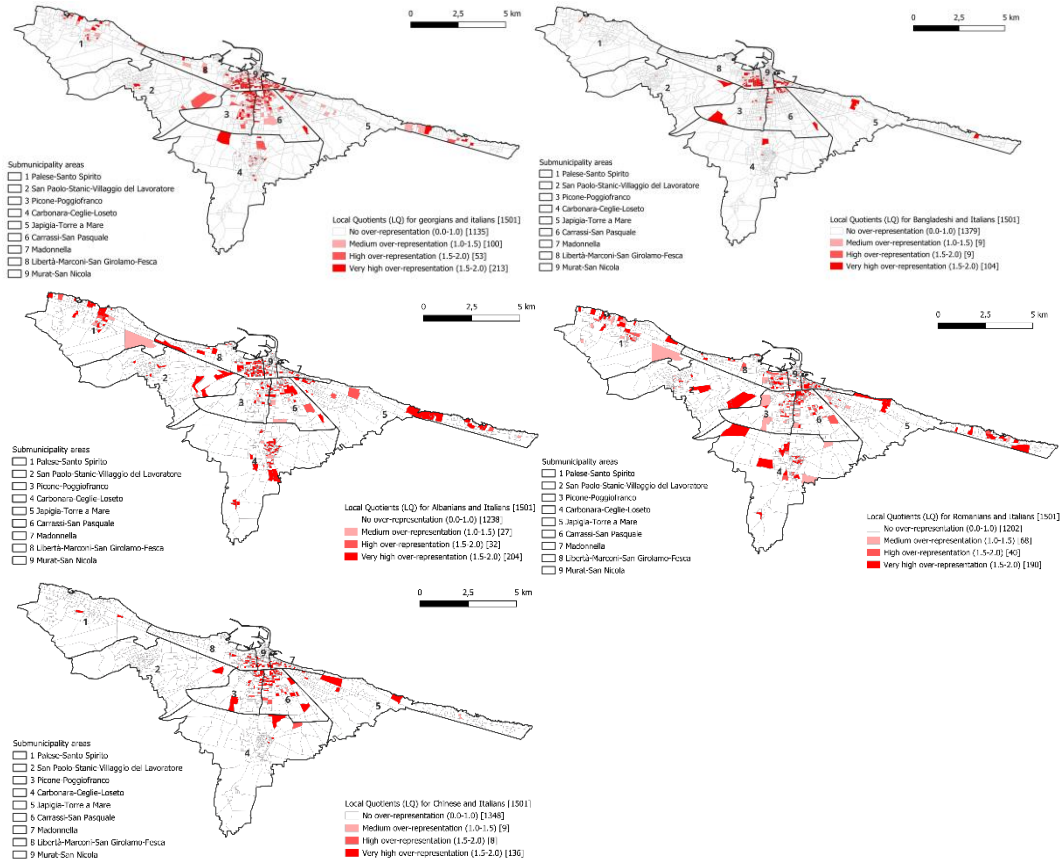
Figure notes: Classes obtained by natural breaks (Jenks) method.

4.2. Differences in the territorial concentration of non-national groups across the city

Figure 2 illustrates the LQs of each one of the top five population subgroups of non-nationals Georgians, Bangladeshis, Albanians, Romanians and Chinese, in this order.

[3] In 2014, sub-municipality areas were grouped into 5 municipalities. We believe that sub-municipality areas are more informative and less concentrated than current municipalities.

Figure 2 – *Local Quotients (LQs) for non-national population subgroups (Georgians, Bangladeshis, Albanians, Romanians and Chinese) respect to nationals (Italians). Bari (2021).*



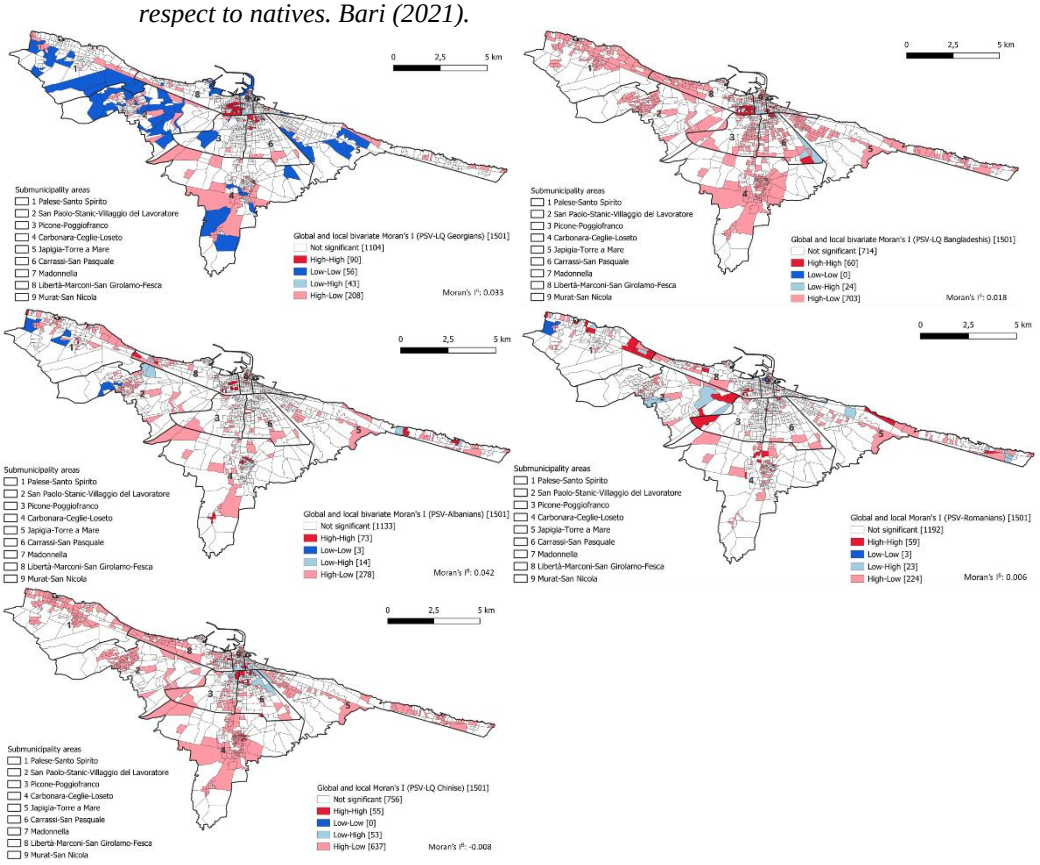
Generally speaking, all non-nationals' population groups show markedly dissimilar spatial distributions respect to the native population. However, interesting differences among groups arise and some deserve to be highlighted. For example, the territorial pattern of Georgians respect to Italians across sub-municipality areas is widely clustered-dispersed, with a very high over-representation in the city center. A spatial pattern that seems to be linked to their likelihood of employment in the care sector. In contrast, Bangladeshis display a spatially clustered pattern with very high levels of concentration in the city center (Libertà and Madonella) and very little

on the outskirts. Chinese, instead, show less areas of concentration clustered dispersed across sub-municipality areas if compared to Georgians, Albanians and Romanians. Mainly, this spatial pattern is related to the location of their economic activities.

4.3. Are Potential Socioeconomic Vulnerability and the territorial concentration of non-national groups spatially correlated?

This section is aimed at analyzing the spatial correlation between the potential socioeconomic vulnerability index and the territorial concentration of each one of the non-national groups under exam respect to Italians. Bivariate Local and Global Moran's I are represented in Figure 3.

Figure 3 – *Global and local bivariate Moran's I for selected non-national population groups respect to natives. Bari (2021).*



A general trend appears, and that is, most census tracts are in the High-Low category, in which high potential vulnerability is spatially linked to low over-representation of non-nationals groups respect to Italians. Although, again, interesting differences emerge when comparing results across the space and among population subgroups. In the case of the spatial correlation between potential vulnerability and the concentration of Georgians and Bangladeshis, sub-urban High-High areas are predominantly clustered in Libertà. For Albanians and Romanians, small and medium High-High sub-urban areas are, respectively, clustered dispersed across sub-municipalities in the city.

5. Discussion and concluding remarks

The empirical analyses performed in this article were aimed at answering the specific research questions. Regarding the first (RQ1), we find relevant differences in the degree of heterogeneity in the sub-urban distribution of potential socioeconomic vulnerability in the city of Bari. In fact, the index shows an island-type spatial distribution of both green and red spots. More specifically, sub-urban areas of high potential vulnerability are spatially clustered and clustered-disperse across the city.

About our second research question (RQ2), findings point out to significant differences in the territorial concentration of the first five non-national groups if compared to Italian residents. There are clustered-dispersed territorial patterns of high and very high concentration across the sub-municipality areas of the city for Georgians, Albanians and Romanians. There are also very high levels of concentration in Libertà and Madonella in the center of the city that are spatially clustered for Bangladeshis. Instead, emerge clear economic centered patterns for Chinese.

Finally, while answering our third research question (RQ3), we find that most census tracts with high levels of potential vulnerability are not necessarily those in which non-nationals populations subgroups are concentrated. Actually, most census tracts are those in which high potential socioeconomic vulnerability is linked to low over-representation of the non-national group respect to the native one. Although, some high-high areas emerge and merit more attention. Findings point to Libertà in the city center as the sub-municipality area where census tracts with high levels of potential vulnerability correspond to high or very high levels of concentration of Georgians and Bangladeshis.

Taken together, our results seem to be given signs of the multiple fragmentation/division of the city of Bari (Musterd and Ostendorf, 2012; Tammaru et al., 2020; Carella et al. 2024). A mosaic city within which there are also clear

traces of duality in terms of socioeconomic and ethnic vulnerability but only in the city center, more specifically, in the Libertà sub-municipality.

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