

Creating a geodemographic classification for older people in England: the Aged in Place Classification

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1. Introduction

The population of England is rapidly ageing. While it has been argued that the ageing population may present an untapped demographic dividend, it will equally challenge the fiscal sustainability of existing models of service provision. Response to either those opportunities or challenges presented are constrained by limited understanding of the differentiation within a population. Thus, we need a functional tool to better understand and support our older population. The aim of the research is to produce a geodemographic classification of older people (aged 50 and over) in England at the small area level (LSOA), enabling more effective service planning and policy development.

The bespoke geodemographic classification which we have created will provide invaluable insights for more effective planning and policy intervention that address the needs and opportunities arising from an older population. First, we will demonstrate how a more nuanced understanding of the characteristics and contexts of the older population can enhance small area estimates of key outcomes (e.g., loneliness and social isolation). Second, in collaboration with the Liverpool City Region Combined Authority (LCRCA) we will demonstrate how planning decisions in relation to housing need can be enhanced by an improved understanding of the needs of the older population. Finally, building on the recent research from Liverpool on '20-Minutes City' (Calafiore et al., 2022), we will demonstrate how the classification can improve and support local service provision for older generations.

2. Research design

The research draws from multiple data sources including the ONS Census, the British Population Survey (BPS) to understand digital access and engagement, the Access to Health Assets and Hazards (AHAH) dataset and the Journey Time Statistics (JTS).

The research relies on established clustering techniques and machine learning methods to build the classification. Firstly, we established the key domains related to older people (Fig. 1) for which a number of variables is computed at a small area (LSOA) level. Secondly, a series of analysis are conducted to evaluate the use of certain predictors in the subsequent clustering. These variables are then normalized and standardized and the k-means clustering algorithm is applied to generate a series of clusters and sub-clusters that describe the grouping of small areas with similar characteristics of older people and their living environment. Finally, these clusters are labelled and "pen portraits" are created to highlight the diverse attributes across the UK in the older population. The bespoke geodemographic classification developed is referred to as 'Ageing in Place' Classification (AiPC).

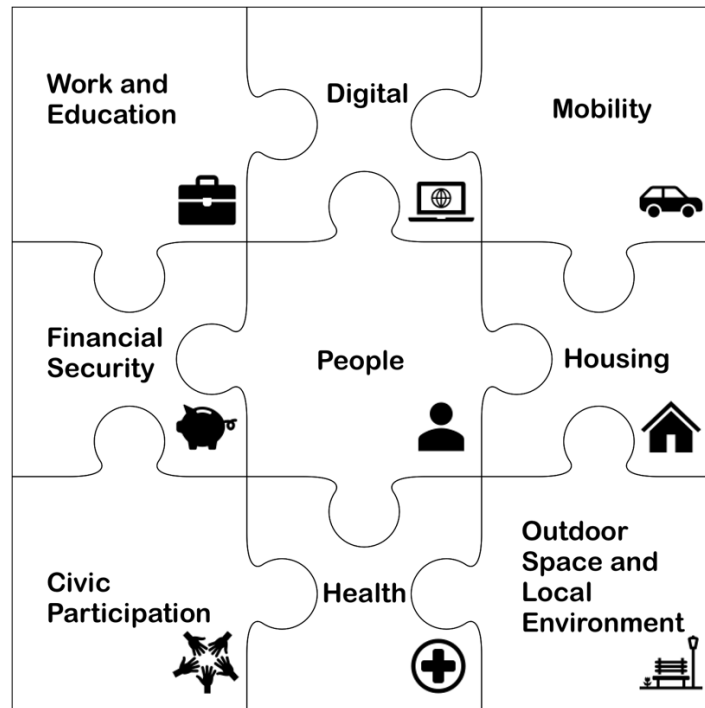


Figure 1. Domains of the classification of older people in England

AiPC used a top-down *k*-means clustering model. *k*-means is repeatedly applied to obtain a two-tier hierarchy structure of classification (Cockings et al., 2020). The top-level of AiPC is firstly determined by *k*-means, and then each cluster in the first tier are examined and further divided to generate the second-tier results. Clustergram were used to provide suggestions on the suitable number of clusters in each tier. Lastly, a ground-truthing validation was conducted to validate the corresponding descriptions of the clusters using a team of 25 peer reviewers, similarly to Vickers and Rees (2011).

3. Results

The AiPC consists of two tiers (Table 1). The top-level (tier 1) of AiPC, termed Supergroups (SG) and contains five clusters, providing the most generic descriptions of the older population (aged 50 and over) and their living environments. Tier 2 contains the Groups (G), further differentiate within the five supergroups of giving an additional 13 clusters. These groups present more detailed descriptions of the people and places they represent and supplement the detail provided in the parent group.

Table 1. AiPC hierarchy and cluster names

Supergroups	Groups
1. Struggling, More Vulnerable Urbanites	1.1 Disadvantaged Single Households
	1.2 Struggling White British
	1.3 Terraced Mix, Relative Stability
2. Multicultural Central Urban Living	2.1 Inner City Diverse Living
	2.2 Peripheral Constrained Diverse Living
3. Rural and Suburban Comfortable Ageing	3.1 Rural Ageing
	3.2 Ageing in the Affluent Fringe
4. Retired Fringe and Residential Stability	4.1 Retired Country and Coastal Living
	4.2 Comfortable Rural/Suburban Ageing Workers and Retirees
	4.3 Constrained Semi-Rural Ageing and Retirement
5. Cosmopolitan Comfort Ageing	5.1 Cosmopolitan Family Ageing

	5.2 Coastal Later Aged Retirees
	5.3 Cosmopolitan Ageing

SG 3, 'Rural/Rural-Urban Fringe, Comfortable Ageing is the largest and oldest cluster, comprising 8,802 LSOAs, 32.6% of the population of England aged 50 and over, and with a median age of 45.37 (Table 3). This contrasts starkly with Supergroup 2, 'Multicultural Central Urban Living'. SG 2 is the smallest and youngest cluster, comprising 3,905 LSOAs, only 7.7% of the population of England aged 50 and over, and with a median age of 30.50. It is of note that this cluster is the most ethnically diverse given that the ethnic minority population of England are relatively youthful. While Supergroups are essential to delineate macro patterns, the analysis of the groups at tier 2 reveal the multi-spectral essence of the English +50 population.

4. Discussion and conclusions

The classification reveals a multi-pictured scenario for 50+ aged people in the UK. Contrasting groups co-exist showing how older people condition might drastically change at granular microscale thus requiring appropriate approaches and solutions to the existing problems.

Household marital status, housing conditions and economic status are key elements to delineate the different ability for the residents to engage in a healthy living in their current area.

Urban centres especially might require interventions to successfully age in place given the adverse effects of the urban environment on older population. While cities usually provide easy access to important services for older people, they are also unattractive given higher cost of living, including the possibility to own a house, the lack of the type of preferred dwellings and not having extra house space. On the contrary, rural and rural-urban fringe areas are where the majority of older people might be able to frictionless age in place (SG 3 and 4). However, this might not be homogenously distributed and it is subject to multiple conditions. Firstly, suburban areas have different setups and some of them might be particularly challenging for the older population as G 1.2 and city-peripheral as G 5.3. Secondly, rural ageing might be challenging given the large distance to service including healthcare and low digital engagement (G 3.1) or higher level of deprivation (G 4.3).

Looking ahead, the digital access seems a promising field of further investigation given its potential role to mitigate some of the adverse characteristics across the identified groups, particularly in the context of the spread of telemedicine, service access and mental well-being (NHS, 2019). However, the current clusters do not suggest that digital engagement is necessarily associated with better conditions for older people.

There are a number of implications the geodemographic classification has to various stakeholders. The AiPC reveals a granular overview on older people in the England and is promisingly well-suited tool to further investigate the needs of the overgrowing UK older population. The existing differences in the groups highlight the need to calibrate different solutions to different audiences. Our ongoing research investigates various challenges and opportunities relevant to these populations and the real world applications of our bespoke geodemographics. More specifically, in the next steps we aim to focus on how AiPC can be applied to better understand the issue of loneliness and to inform more targeted interventions to improving and readapting housing stock and how new service provisions for older people can be better integrated at a neighbourhood level.

References

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