

Inequalities in spatial accessibility to care home in Scotland

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Summary

This paper mapped spatial accessibility to care homes for older people in Scotland and examined its variation by urbanity and deprivation. The care home data was collected from Care Inspectorate and road networks and other data were collected from Ordnance Survey and governmental agencies. The three step float catchment areas approach was used to quantify spatial accessibility. It was found that there are significant inequalities by urban rural types and deprivation. The accessibility of care home to general practice and green space was also varied over urban and rural types.

KEYWORDS: Spatial accessibility, Care home, Older people, Inequalities, Scotland

1. Introduction

Care home services are essential to provide long term residential care for older people (Barker et al 2021). Most existing research on care home focuses on profiles of residents, health status, and impact of physical environment on mental wellbeing (Potter et al 2018; Giebel et al 2022; Barker et al 2021). Little research has been carried out on spatial pattern and spatial accessibility of care homes. There are exceptions with two recent articles separately examining accessing care homes in the US (Reddy et al 2022) and equity issues to community care facilities in China (Ning et al 2022). This study thus fills the research gaps focusing on care homes in Scotland where supporting increasing numbers of adults with complex health and social care needs due to rising levels of multimorbidity and frailty, associated with population ageing has been found challenging.

Spatial accessibility is of importance for care homes as location is one of the most frequently cited factor in the choice of home by residents (Reddy et al 2022). It is of also essential to identify areas with poor access to care home which provides evidence for authorities to intervene in meeting the needs of older people. In addition residents in care homes need to keep social networks thus a good level of accessibility could meet this demand as well. Accessing to primary health care and physical environment is critical for health and wellbeing of care home residents thus the study also explored this dimension (Gordon et al 2014; Barker et al 2021). This paper addressed three research questions: 1. to map spatial accessibility to care home from local areas at the data zone level; 2. to examine variation of accessibility levels by urbanity and deprivation; and 3. to examine accessibility of care homes to primary health care and green space.

2. Data and methods

A care home is defined as a nursing or residential care facility that provides 24-hour care to its residents. We collected the care home data of 2021 from the datastore of Care Inspectorate. The data include profiles of care homes including address. The total number of beds was used as the measure of care home capacity. The road networks and green space data of 2021 were acquired from Ordnance Survey via the Digimap service. SIMD (Scottish Index of Multiple Deprivation) of 2020 and urban rural classification data of 2020 were from the Scottish Government open source depository. The location of general practices of 2021 was from the Public Health Scotland.

The 3SFCA method (Wan et al 2012) was applied to assess spatial accessibility to care homes with the Gaussian distance weight being used to measure distance decay effect. The data zones were used as analytical units with people aged 65 and over as the population group potentially in demand of care home services. A 30 min driving zone was used to define the catchment for both care homes and data zones. For data zones population weighted centroids were used to build the 30 min driving buffer. SIMD quintiles and the 8 folder urban rural classification were used to assess the variation of spatial accessibility to care homes by deprivation and urban rural types. Geographical accessibility to green space and general practice was evaluated by calculating walking times from care homes.

3. Results

There were in total 804 care homes for older people providing 35856 beds in Scotland in 2021. However, 38 care homes shared the same postcode with another care home. Therefore we combined the care homes down to 785 locations. The number of total beds was subsequently aggregated for care homes that shared the same postcode. The distribution of care homes and population aged 65 and over is showed in Figure 1.

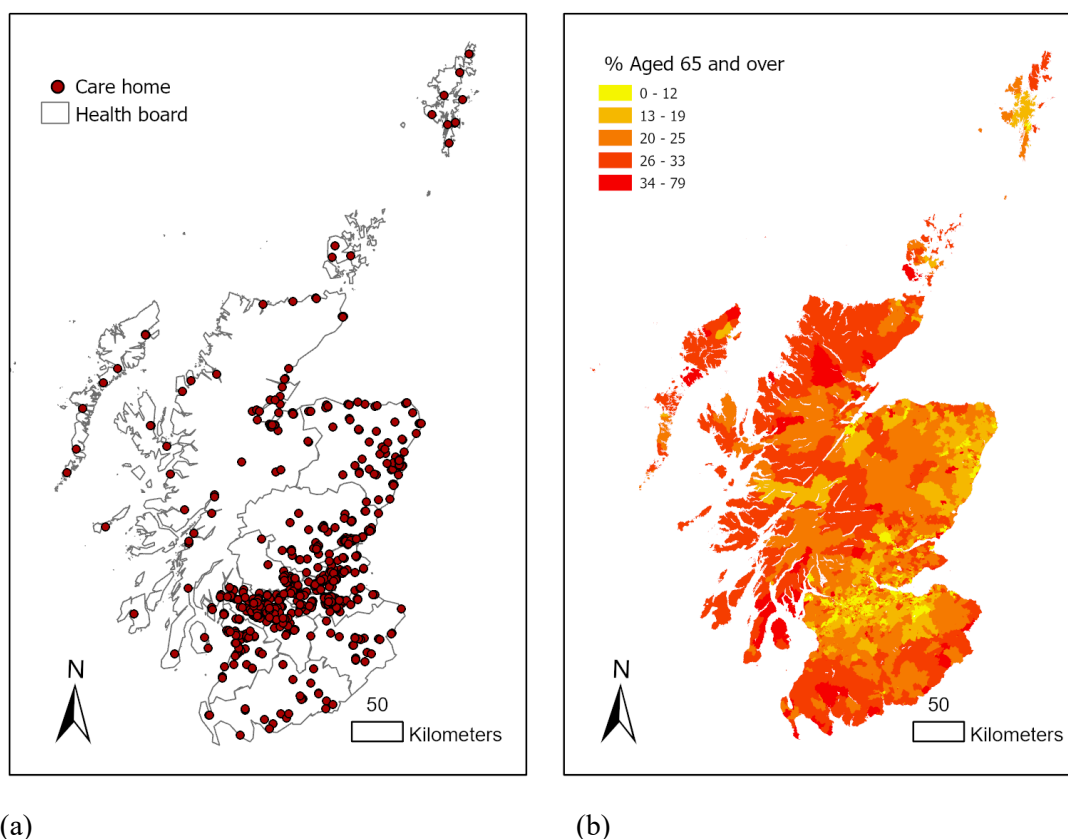


Figure 1 Distribution of care homes (a) and distribution of population aged 65 and over (b)

The spatial accessibility index derived from the 3SFCA method is showed in Figure 2. There were 21 data zones which did not have access to care home within a 30 min drive. The variation between urban and rural types was evident (Table 1). The Largest Urban Areas displayed the highest level of accessibility (0.036) and the Very Remote Rural Areas the lowest (0.026). Also the variation by urbanity was statistically significant (Table 1). The variation between deprivation quintiles was minor. The highest index was for the most deprived areas with a value of 0.035 while in contrast the lowest index was for the quintile 3 with a value of 0.032. The ANOVA test indicated the variation was significant at 5% significance level.

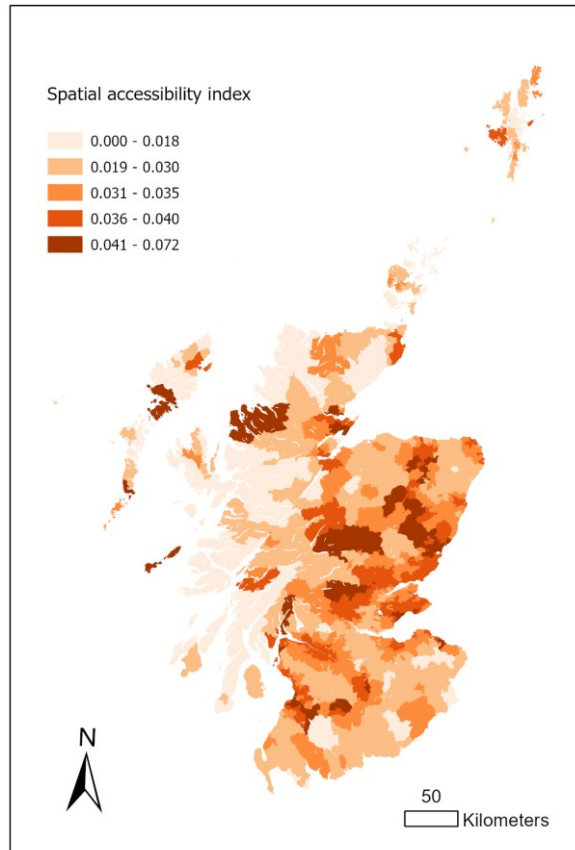


Figure 2 Spatial accessibility to care homes in Scotland

Table 1 Spatial accessibility to care home by urban rural classification

Urban rural types	N	Mean	95% confidence intervals
1 Large Urban Areas	2,496	0.0361	0.0361 - 0.0362
2 Other Urban Areas	2,459	0.0333	0.0331 - 0.0335
3 Accessible Small Towns	613	0.0313	0.0310 - 0.0317
4 Remote Small Towns	104	0.0326	0.0313 - 0.0338
5 Very Remote Small Towns	98	0.0301	0.0284 - 0.0318
6 Accessible Rural Areas	805	0.0314	0.0311 - 0.0318
7 Remote Rural Areas	197	0.0306	0.0292 - 0.0321
8 Very Remote Rural	204	0.0235	0.0215 - 0.0255

ANOVA test: $F = 280.9$, $p < 0.000$

Table 2 Spatial accessibility to care home by deprivation

Deprivation quintile	N	Mean	95% confidence intervals
1 Least deprived	1,395	0.0351	0.0349 - 0.0353
2	1,395	0.0334	0.0331 - 0.0337
3	1,395	0.0321	0.0318 - 0.0325
4	1,395	0.0328	0.0325 - 0.0331
5 Most deprived	1,396	0.0341	0.0338 - 0.0343

ANOVA test: $F = 60.7$, $p < 0.000$

Regarding accessibility of care homes to general practice, slightly over a third of care homes were within a 10 min walk while close to 30% needed at least 20 min. By deprivation, care homes in the

most deprived areas have slightly better access to general practice with close to half of them being within a 10 min walk. Care homes in the medium level of deprivation showing the lowest level of accessibility to general practice with below 30% being able to access a general practice within 10 min. Overall accessibility to green space was very high. Nearly 90% of care homes were within a 10 min walk of a public park. Again the most deprived areas showed the best accessibility with over 96% being within 10 min of a public park. The care homes in the medium level of deprivation displayed lowest level of accessibility to green space, over 10% lower than that from care homes in the most deprived areas.

4. Conclusions

In this paper we examined the disparities in spatial accessibility to care homes in Scotland using publicly available data. It was found that there was significant, non-linear variation of spatial accessibility of care homes by urbanity and deprivation. However, the size of variation between deprivation types was quite small while that between urban rural types was more considerable. Although deprivation areas is not disadvantaged in terms of accessibility to care homes, further research can explore whether accessing the high-quality care home varies by deprivation (Reddy et al 2022). The areas with poor access were concentrated in remote rural areas. This research provides evidence for policy consideration in determining locations of care homes in future to meet the needs of remote areas.

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Biographies

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