

Background

In recent years, awareness has increased that there are socioeconomic disparities in access to natural outdoor environments (NOE). However, how such disparities matter in different life stages is still unclear. This study assessed the associations between life-course socioeconomic status (SES) and access to public natural environments in older adults using the Northern Ireland Cohort for the Longitudinal Study of Ageing (NICOLA).

Data and methods

Distance between participants' housing addresses to the nearest access points of public natural environments (park and garden, open space, nature reserve, woodland and bluespace) was assessed using the GreenspaceNI Map. Life-course SES was assessed in childhood (self-reported childhood SES and childhood unemployment of parents), adulthood (education) and elderhood (Area-level Multiple Deprivation Measure and capital value of the housing), respectively. Multilevel linear regression models were used to assess the associations, and a series of sensitivity analyses were conducted. Further, we stratified the results by urban, intermediate and rural regions to test the urban-rural differences.

Figure 1 The spatial distribution of different NOE amenities in NI

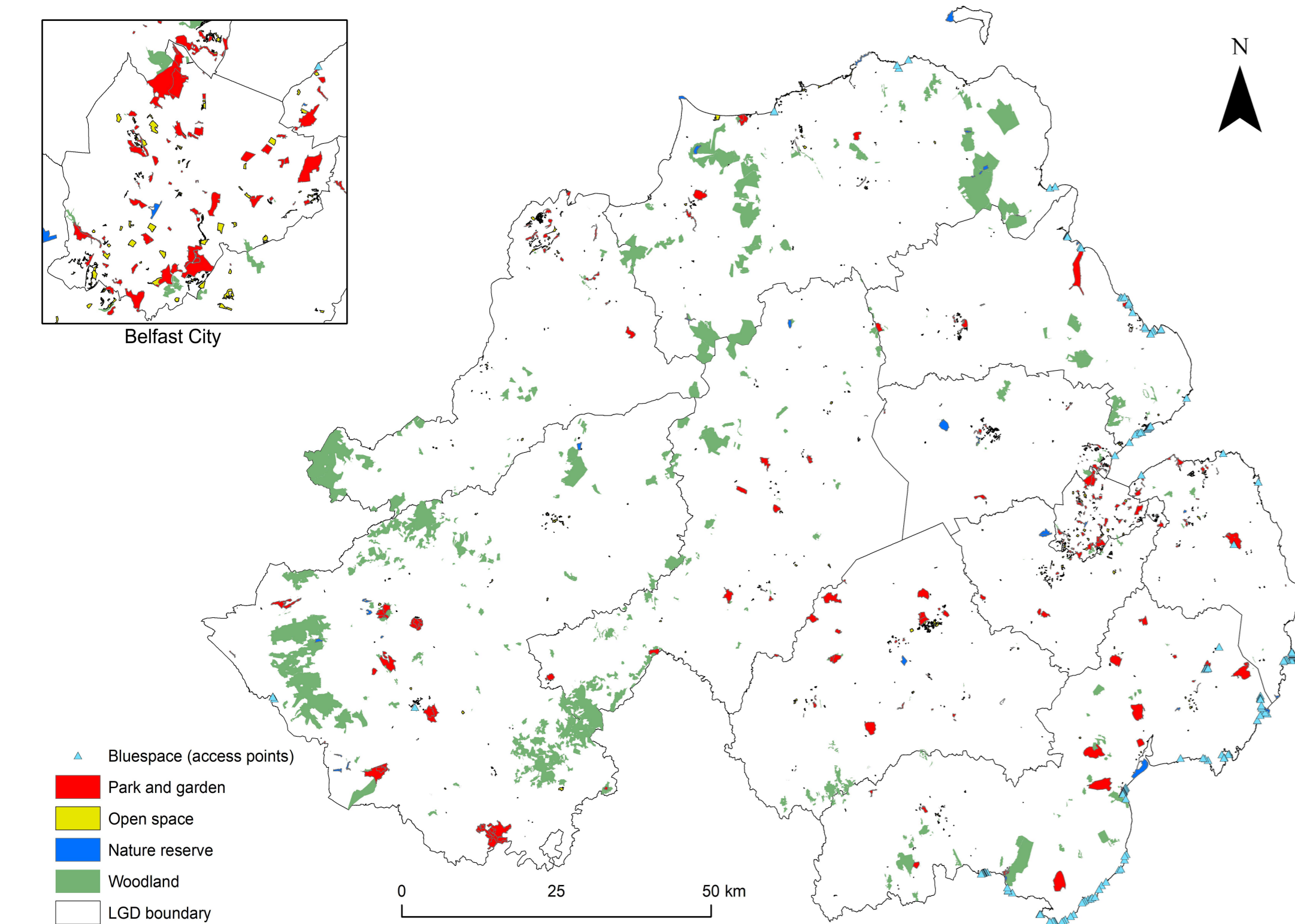


Figure 2 Regressing access to different NOE amenities on life-course SES indicators in NI.

	Model1a: DV = Public open spaces	Model1b: DV = Parks and gardens	Model1c: DV = Woodland	Model1d: DV = Nature reserves	Model1e: DV = Blue spaces
	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)	Coef. (SE)
Sex (ref = Female)					
Male	-0.022(0.035)	0.010(0.031)	-0.005(0.020)	0.005(0.021)	0.039(0.026)
Age (ref = < 60)					
60-69	-0.015(0.048)	0.006(0.042)	0.011(0.027)	-0.031(0.029)	-0.060(0.036)
70-79	-0.046(0.060)	-0.012(0.053)	0.022(0.034)	0.013(0.037)	-0.039(0.045)
> 80	0.029(0.077)	0.029(0.068)	0.070()	0.001(0.047)	-0.017(0.058)
Marital status (ref = Married/cohabiting/same-sex civil partnership)					
Never married	-0.216(0.067)	-0.066(0.059)	-0.018(0.038)	-0.114***(0.041)	-0.237***(0.050)
Separated/divorced/widowed	-0.063(0.043)	-0.064*(0.038)	0.015(0.025)	-0.125***(0.026)	-0.223***(0.032)
Education (ref = Primary/none)					
Secondary	0.040(0.047)	0.040(0.041)	-0.005(0.027)	-0.021(0.029)	-0.050(0.035)
Higher	0.072(0.053)	0.012(0.047)	0.038(0.030)	-0.036(0.033)	-0.094** (0.040)
Employment (ref = Retired)					
Employed	-0.043(0.050)	-0.058(0.044)	0.006(0.028)	-0.015(0.030)	0.011(0.037)
Unemployed	-0.174(0.112)	-0.035(0.099)	0.075(0.064)	-0.062(0.068)	-0.037(0.084)
Others	-0.044(0.061)	0.049(0.054)	0.008(0.035)	0.043(0.037)	0.074(0.046)
Area level Multiple Deprivation Measure (ref = 1 Most deprived)					
2	-0.005(0.067)	0.062(0.058)	0.040(0.037)	-0.037(0.042)	0.021(0.052)
3	-0.126*(0.070)	-0.093(0.061)	-0.074*(0.038)	0.004(0.044)	0.027(0.054)
4	-0.148** (0.073)	-0.132** (0.064)	-0.004(0.040)	-0.066(0.046)	-0.117** (0.057)
5 Least deprived	-0.090(0.076)	-0.064(0.066)	0.007(0.041)	-0.026(0.048)	0.002(0.059)
Capital value of the housing (ref = <£99,999)					
£100,000-£199,999	-0.018(0.043)	-0.012(0.038)	0.003(0.025)	-0.025(0.027)	-0.005(0.033)
£200,000-£299,999	0.039(0.066)	0.013(0.058)	-0.058(0.038)	0.020(0.040)	0.078(0.050)
>£300,000	-0.017(0.102)	0.149*(0.090)	-0.021(0.057)	0.034(0.062)	-0.078(0.076)
Childhood socioeconomic status (ref = Average or well)					
Poor	-0.063(0.043)	0.072** (0.036)	-0.028(0.025)	0.000(0.026)	-0.013(0.032)
Childhood unemployment of parents (ref = No)					
Yes	0.002(0.117)	-0.048(0.104)	0.052(0.067)	-0.109(0.072)	-0.074(0.088)
Duration of residency (ref = < 5 years)					
>= 5 years	0.002(0.117)	0.070(0.062)	0.036(0.040)	0.068(0.043)	-0.001(0.052)
Region (ref = Urban)					
Intermediate	0.084(0.075)	0.065(0.064)	-0.006(0.039)	-0.045(0.049)	-0.088(0.061)
Rural	0.056(0.082)	0.031(0.070)	-0.021(0.042)	-0.087(0.053)	-0.186***(0.065)
Variance (Ward level)	0.209	0.143	0.044	0.101	0.153
Variance (Individual level)	2.019	1.584	0.662	0.748	1.127
Log likelihood	-13324.723	-12407.732	-9140.602	-9684.661	-11205.5
AIC	26701.34	24867.46	18333.2	19421.32	22463

Note: DV = dependent variable; Coef = coefficient; SE = standard error; AIC = Akaike information criterion. *p < 0.10, **p < 0.05, ***p < 0.01.

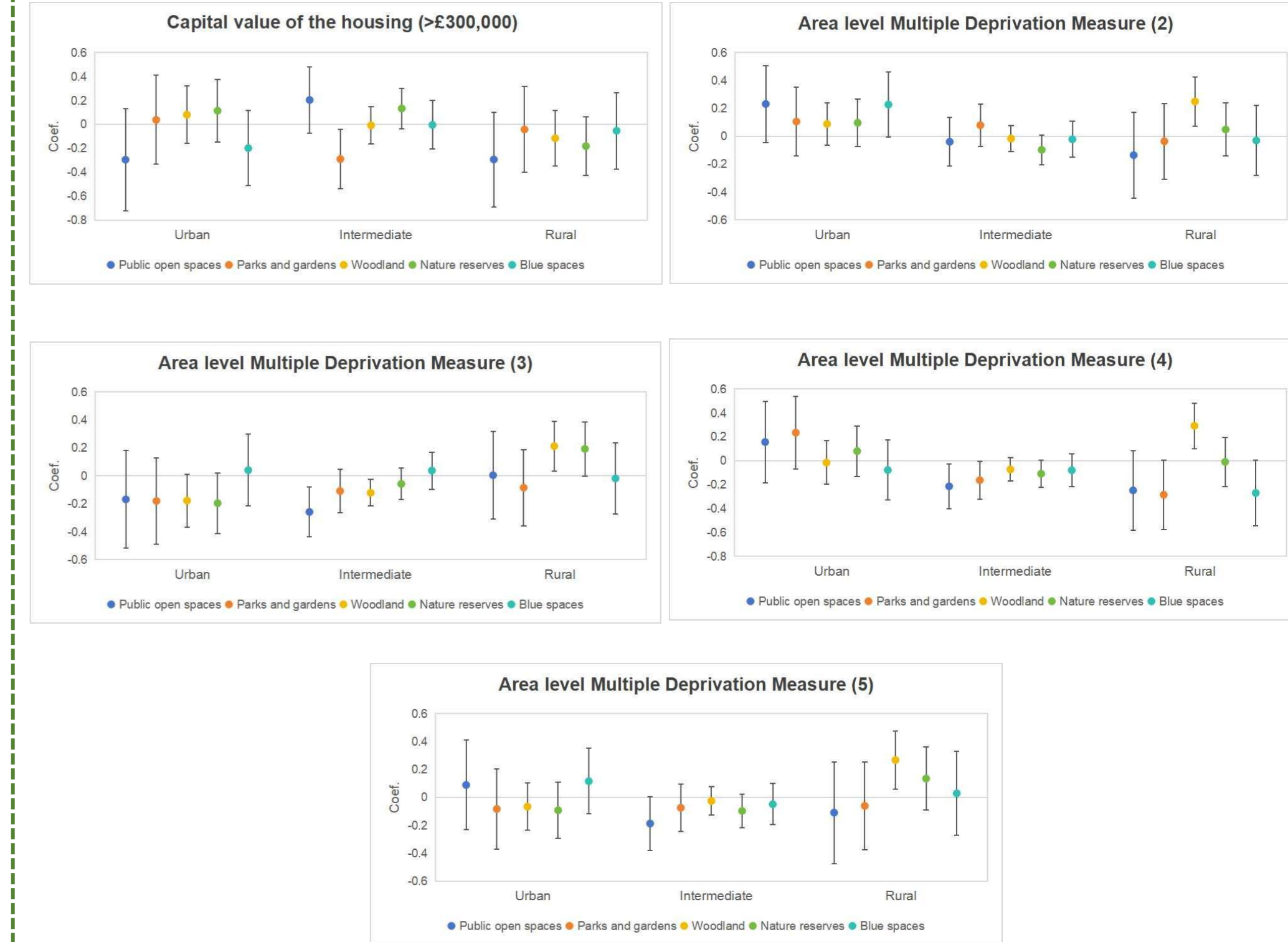
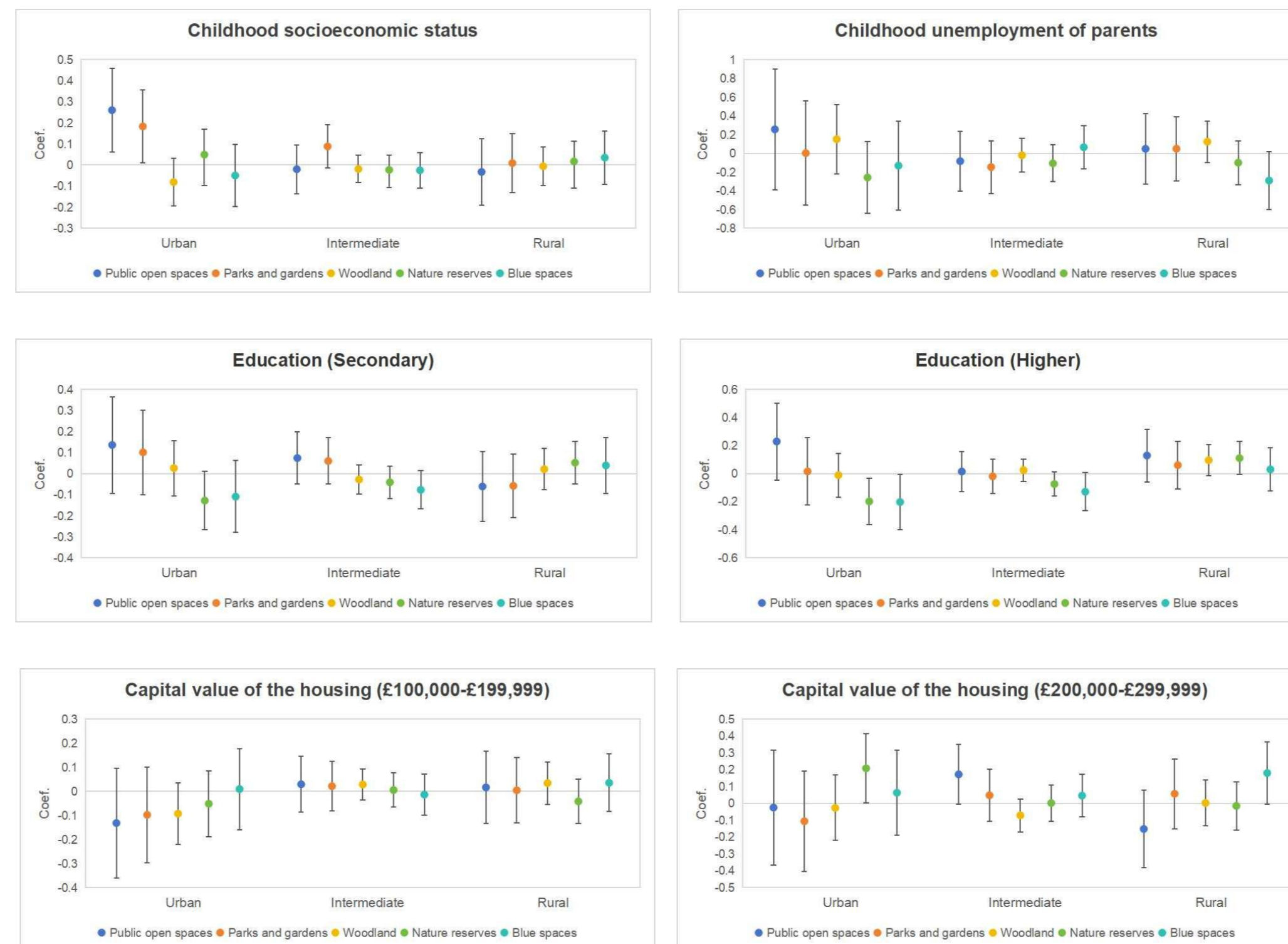


Figure 2 Urban-rural differences in the association between life-course SES indicators and access to different NOE amenities in NI.

Results

Results show that participants with higher SES in childhood, adulthood and elderhood lived closer to different public natural environments. Also, there are urban-rural differences in such associations. For example, the effects of childhood and adulthood SES were more pronounced in urban regions, while the effect of elderhood SES was stronger in intermediate regions.

Conclusion

These findings provide evidence that there are life-course socioeconomic disparities in older adults' access to different natural environments, and they vary among urban, intermediate and rural regions.