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Socioeconomically-deprived patients suffer hip fractures at a younger age and require more hospital admissions, but early mortality risk is unchanged: the IMPACT Deprivation Study

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ABSTRACT

Introduction

Socioeconomic deprivation is associated with multi-morbidity and frailty, but influence on hip fracture outcomes is poorly understood. The primary aim was to investigate the association between deprivation and mortality, and secondary aims were to assess the effects on: i) age at presentation; ii) inpatient outcomes, and iii) post-discharge outcomes.

Method

This cohort study included all patients aged >50 years admitted with a hip fracture to a high-volume centre between 01/03/20–20/11/21. Data were collected contemporaneously by specialist auditors and underwent validation using live health records after 180 days follow-up. Variables were demographics including Scottish Index of Multiple Deprivation, injury and management factors, and outcome measures including length of stay, discharge destination, readmission, and mortality status at 180 days.

Results

There were 1822 patients of which 1306/1822 (72%) were female. Deprivation was independently associated with younger age at hip fracture, demonstrating a linear correlation with each deprivation level. The overall mean age was 80.7 years (range 50-102), with the mean age in the most deprived group being 77.2 years (95% CI; 75.7-78.7) versus 82.8 years (95% CI; 82.0-83.5) in the least deprived. Multivariate logistic regression showed no association between deprivation and 30-day or 180-day mortality risk. Kaplan-Meier survival analysis demonstrated no difference between the most deprived versus least deprived (log-rank, p = 0.854). Deprivation had no influence on length of stay, discharge destination, or COVID-19 status, but deprived patients had an increased risk of readmission (OR 1.63, 95% CI (1.18-2.24); p=0.003).

Conclusion

Deprivation showed no linear correlation with early mortality risk (within 180 days of injury), but it was associated with an earlier age at presentation (the most deprived sustained a hip fracture 5.6 years earlier than the least deprived) which may impact overall life expectancy. More deprived patients were more likely to require further acute hospital admissions.

KEYWORDS

Hip fracture, deprivation, mortality, outcomes, frailty, multi-morbidity, trauma

INTRODUCTION

Over 70,000 patients are admitted to UK hospitals every year following an acute hip fracture generating an estimated annual cost to the health service exceeding £1.2 billion. (Andrew Judge et al., 2016; National Institute for Health and Care Excellence, n.d.) Outcomes following hip fracture are poor with a recent meta-analysis of European countries demonstrating an average one-year mortality of 23%. (Downey et al., 2019) Hip fracture patients experience prolonged admissions, with the UK average time in hospital following acute hip fracture being 26 days, though significant regional variations are seen. (Colin Currie et al., n.d.) Furthermore, re-admissions to acute hospitals are common and evidence suggests that these rates are increasing. (Department of Health and Social Care, n.d.) An understanding of the factors associated with favourable outcomes is therefore important to improve modifiable factors and mitigate the deleterious effects of others in order to improve patient care.

With the benefit of national hip fracture registries, many factors associated with poor outcomes are well understood. There is extensive evidence demonstrating the association between adverse outcome and patient-related factors such as male sex, increased age, frailty, co-morbidity, the presence of cognitive impairment and dementia, and communicable disease such as COVID-19. (Clague et al., 2002; Dailiana et al., 2013; Hall et al., 2022; Narula et al., 2020; Neuman et al., 2017; Rostagno et al., 2016) Various service-related factors have also been demonstrated to be associated with poorer outcomes including delayed time to theatre, hospital case-volume, day of admission, and adherence to national care standards. (Farrow et al., 2018, 2020, 2021; Metcalfe et al., 2019)

Social deprivation is not defined exclusively by poverty, but rather a multitude of factors that prevent culturally normal interactions between an individual and the rest of society. Previous studies have demonstrated that social deprivation is associated with poor health status and increased levels of multi-morbidity and frailty, and that frailty can be assessed as a useful metric during admissions. (Kay et al., 2022; Lang et al., 2009; Pathirana & Jackson, 2018) It is therefore understandable that individuals in lower socioeconomic groups are at increased risk of all-cause mortality. (Eames et al., 1993) With regards to hip fracture, social deprivation is associated with a higher incidence and a lower mean age at the time of injury. (Farahmand et al., 2000; Quah et al., 2011) Factors such as multimorbidity, poor diet, physical inactivity, smoking and alcohol use are all understood to negatively impact bone health and increase the likelihood of sustaining a hip fracture. (Bacon & Hadden, 2000; Farahmand et al., 2000; Quah et al., 2011) Mortality has also been shown to be higher in more deprived hip fracture patients, a recent meta-analysis reported a 14% increase in one-year mortality rate following hip fracture in the most deprived areas compared to least. (Valentin et al., 2020)

The influence of deprivation on outcomes other than mortality are poorly understood. Evidence regarding length of hospital stay (LOS) and re-admission rates is limited and lacks consensus. (Kristensen et al., 2017; Patel et al., 2021; Quah et al., 2011; Smith et al., n.d.) Less than 60% of all hip fracture patients return to their previous residence and level of care following discharge from hospital (Deakin et al., 2008), and factors associated with reduced 'return to domicile' rates include pre-fracture health, functional status and cognitive impairment. (Nanjayan et al., 2014) However the effect of deprivation on post-injury performance status and return to admission residence remains unquantified.

The primary aim of this study was to investigate the association between social deprivation and mortality at 30 and 180 days following hip fracture. Secondary aims were to assess the effects of deprivation on: i) age at presentation with hip fracture; ii) inpatient outcomes (COVID-19 status during admission and length of stay), and iii) discharge outcomes (rate of readmission to acute hospital settings and return to domicile).

METHODS

Data collection

The study included all patients aged over 50 years who were admitted with a hip fracture to the Royal Infirmary of Edinburgh during a 21-month period (1st March 2020 – 30th November 2021). This included all patients with an intracapsular or extracapsular fracture involving the proximal femur until the distal limit of the subtrochanteric region (defined as five centimetres distal to the lesser trochanter). It excluded patients with isolated fractures of the acetabulum, pubic ramus, greater trochanter, and fractures around an existing implant.

Data were collected directly from health records and service documentation by specialist local audit coordinators (LAC) familiar with the clinical condition and the study centre. The data were collected and assessed for completeness by a senior analyst as part of the routine activity of the Scottish Hip Fracture Audit (SHFA). These local SHFA data were collated and validated by a study author (AH) using live electronic health records and cross-referenced with an independent dataset from the local International Multicentre Project Auditing COVID-19 in Trauma & Orthopaedics (IMPACT) Group. (Hall et al., 2021) All data were handled in accordance with the UK Caldicott principles. ('The Caldicott Report.', 1999)

Scottish Index of Multiple Deprivation

The Scottish Index of Multiple Deprivation (SIMD) is a relative measure of socioeconomic deprivation. (*Introducing The Scottish Index of Multiple Deprivation 2016*, 2016) This scoring system measures deprivation across seven domains: current income, employment, health, education, skills and training, housing, geographic access and crime. Across Scotland, 6,976 small areas termed 'SIMD data zones' are assigned scores using an assimilation of the seven measures of deprivation, with each data zone containing an average population of 760 people. Theses assimilated scores are then used to rank each data zone nationally, with rank one representing the least deprived area and rank 6,976 the most deprived. The current study utilised the updated SIMD rankings published in 2016. Quintiles were derived using SIMD rank at a population level, with quintile one representing the least deprived and five representing the most deprived.

Outcome measures

Acute length of stay (Acute LoS) was defined as the number of days between initial presentation with a hip fracture and discharge from the acute orthopaedic unit (or an acute unit of the equivalent level of care if the patient was inpatient with another hospital specialty). Discharge destination, readmission date and readmission specialty data were obtained from the regionwide electronic health record system. Post-discharge functional outcome was calculated by comparing pre-fracture functional status level with functional status level following discharge from inpatient care. Mortality was determined at 30 and 180 days following hip fracture presentation.

Statistical analysis

IBM SPSS Statistics version 25 was used for statistical analysis (SPSS Inc., Chicago IL, USA). Data were assessed for normality and parametric tests where appropriate. To assess the difference in mean between continuous numerical variables (normally distributed) either an unpaired Student's t-test or a one-way analysis of variance (ANOVA) was used. Dichotomous variables were assessed using chi-squared test to assess difference between groups. Multivariate logistic regression was used to assess SIMD quintile as an independent predictor of hip fracture outcomes after adjusting for appropriate co-variates. Simple linear regression was used where appropriate to examine continuous dependant variables. Kaplan-Meier methodology was used to examine the association between SIMD quintiles and survival. A p value of <0.05 determined statistical significance.

RESULTS

Study cohort characteristics

The study cohort consisted of a total of 1822 patients who sustained a hip fracture between 1st March 2020 – 30th November 2021. Seventy-two percent (1306) of the cohort were female and 28% (516) were male. The mean age of the patient cohort was 80.7 years old (range 50 -102), with males demonstrating a lower mean age at the time of hip fracture (78.9 (SD 10.8) vs. 81.4 (SD 9.7); p< 0.00). The cohort was relatively affluent, with 33% in the least deprived quintile versus 12% in the most deprived quintile. The majority of patients (62.5%) were American Society of Anaesthesiologists (ASA) grade III (severe systemic disease). Overall, only 6.6% of the patient cohort contracted COVID during admission. (Table 1)

Influence of deprivation on mortality at 30 and 180 days

Multivariate logistic regression adjusted for the co-variates age and sex demonstrated no significant difference in 30-day mortality according to SIMD quintile, while mortality at 180-days demonstrated a statistically significant reduction in mortality in the third quintile compared to the least deprived (reference) quintile (OR 0.42, 95% CI (0.27-0.64); p<0.00) (Table 2). Unadjusted analysis of mortality using chi-squared test revealed no statistical difference in 30-day mortality (p=0.285) but did demonstrate significant difference in 180-day mortality (p<0.01) (Table 3). However, no linear correlation between SIMD quintile and mortality at 180 days was seen and there was no evidence to suggest greater mortality with increased deprivation. Each one-year increase in age was associated was an increased odds ratio of mortality at 30 and 180 days (OR 1.05, 95% (10.3-1.07); p<0.00 and OR 1.06, 95% CI (1.05-1.08); p<0.00, respectively). Male sex demonstrated increased mortality odds ratio at 30 and 180 days (OR 2.13, 95% CI (1.47-3.01); p<0.00 and OR 2.43, 95% CI (1.88-4.14); p<0.00, respectively). Kaplan-Meier survival analysis comparing the most deprived two quintiles versus the least deprived two quintiles demonstrated no statistically significant difference in survival over the first 180 days following hip fracture (log-rank (Mantel-Cox) p = 0.854). (Figure 1)

Influence of deprivation on age at time of hip fracture

The mean age at time of hip fracture demonstrated a stepwise decline with each increase in deprivation quintile (ANOVA, p<0.000) (Table 4). The most deprived quintile had an average age of 77.2 (95% CI; 75.7-78.7), while the least deprived quintile had an average age of 82.8 (95% CI; 82.0-83.5). Linear regression analysis adjusted for sex demonstrated SIMD quintile to be a significant independent predictor of age at time of hip fracture (Table 5). Those in the most deprived SIMD quintile experienced their hip fracture 5.3 years earlier than those in the least deprived quintile after adjusting for sex.

Influence of deprivation on early inpatient outcomes

One-way ANOVA examining length of acute hospital stay did not demonstrate any significant difference between the SIMD quintiles (ANOVA, p=0.518). Multivariate logistic regression adjusted for the co-variates age and sex demonstrated no significant difference in odds ratio of contracting COVID whilst an inpatient across the SIMD quintiles, with the least deprived quintile serving as the reference category (Table 6). No association was observed between either age or sex and contracting COVID during admission (OR 1.01 (95% CI 0.99-1.04) and OR 0.98 (95% CI 0.60-1.59) respectively).

Influence of deprivation on post-discharge outcomes

Multivariate logistic regression analysis adjusted for age and sex demonstrated an increased odds ratio of readmission to an acute hospital setting in the most deprived quintile compared to the least deprived quintile (OR 1.63, 95% CI (1.18-2.24); p=0.003) (Table 7). In those who were admitted directly from home (n=1384) there was no statistically significant difference in return to home rate according to SIMD quintile when adjusting for age and sex (Table 7). Increasing age was associated with reduced likelihood of returning to home on discharge (OR 1.06, 95% CI (1.05-1.08); p<0.00).

DISCUSSION

The findings of this study demonstrate that socioeconomic deprivation was associated with a younger age at hip fracture presentation, with the mean age of the most deprived quintile being more than 5 years younger than the least deprived. Adjusting for age and sex, socioeconomic deprivation was not independently associated with increased mortality at 30 or 180 days following acute hip fracture. While a reduction in mortality was seen in the middle deprivation quintile at 180-days, there was no linear correlation between deprivation and mortality. Readmission rates were higher in the most deprived quintile compared to the least suggesting potential implications for the discharge planning of these patients. Other outcomes such as length of acute hospital stay, return to home and rate of COVID during admission were not seen to be influenced by socioeconomic deprivation.

The findings demonstrate a direct correlation between deprivation quintile and age at the time of hip fracture, which is consistent with existing literature, however the mean age difference of over 5 years between the most and least deprived quintiles was greater than reported in previous studies. (Clement et al., 2013; Quah et al., 2011; Thorne et al., 2016) The increased difference in age reported in this study aligns with recent data demonstrating that the disparity in life expectancy between the most and least deprived is widening (Bennett et al., 2018). Deprivation is known to be associated with increased frailty and reduced bone health due to multiple factors including multimorbidity, poor diet, physical inactivity, smoking and alcohol, (Bacon & Hadden, 2000) such factors are likely responsible for the association between deprivation and age at time of hip fracture reported in this study and previous literature. Acute hip fracture is regarded as a life-limiting condition. Although this study did not demonstrate a correlation between deprivation and death within 180 days of injury, the substantially younger age at which more deprived patients sustain a hip fracture compared to less deprived patients may confer a greater risk of dying at an earlier age. This may also indicate that more deprived hip fracture patients place a higher demand on health and social care services from an earlier age than more affluent patients, which provides useful insight into post-discharge care planning, counselling and service design.

Deprivation was not associated with increased mortality at 30 or 180 days following acute hip fracture in the study population. There was a lower 180-day mortality risk for patients in the middle deprivation quintile compared to the least deprived quintile, although this was an isolated significant finding and the authors do not consider the data to demonstrate a linear correlation. These findings differ from recent literature using similar methodology to examine deprivation and hip fracture mortality. Two multicentred studies by Thorne et. al. and Patel et. al. used the index of multiple deprivation (IMD) to investigate the impact of deprivation on hip fracture mortality. (Patel et al., 2021; Thorne et al., 2016) Both authors reported a statistically significant increase in mortality odds ratio in the most deprived quintile compared to the least deprived. It is possible the significantly larger sample size of these studies is accountable for the difference in findings. Alternatively, as more deprived patients experience their hip fracture at a younger age, the exclusion of patients under 60-years-old in the study by Patel et. al. may introduce a selection bias. However, Thorne et al. included all patients aged 18 and over and demonstrated a linear relationship between deprivation quintile and hip fracture mortality. The authors do accept that with 33% of patients in the least deprived quintile, this may also have influenced our results. There have been other studies using area-based deprivation measures that have failed to demonstrate a consistent correlation between deprivation and mortality. Colais et al. saw increased 30-day mortality in one of their study periods but not the other, while Clement et. al. did not find any correlation between deprivation and mortality. (Clement et al., 2013; Colais et al., 2013)

Patients in the most deprived quintile were at higher risk of re-admission to an acute hospital setting compared to the least deprived quintile, which is consistent with existing evidence. (Patel et al., 2021) Only the most deprived quintile was at heightened risk of readmission, which suggests that services should be focused to support this group in order to reduce the disparity in post-discharge outcomes and associated morbidity. There was no influence of deprivation on return to domicile following hip fracture for patients admitted from their own home. As far as the authors are aware, there have been no previous studies examining the influence of deprivation on return to home or change of residence on discharge. The analysis examined change in discharge residence only in those admitted from home for two reasons. Firstly, patients that lose their ability to live independently result in the greatest increase in demand on health and social care services, and secondly due to challenges in comparing levels of dependency and care needs accurately.

A limitation of this study is the relatively modest sample size compared to other research examining the impact of social deprivation hip fracture outcomes. Secondly, the current cohort was relatively affluent, with 33% of the cohort within the least deprived SIMD quintile. A future direction for this work is to combine data from multiple regions to include a larger sample that is even more generalisable to the wider population. The Scottish Index of Multiple Deprivation was used in the present study to examine deprivation. However, it could be argued that individual measures of deprivation (such as education, income, and employment) are more specific to the individual compared to area-based measures, but the SIMD is valid, well-recognised, and can be applied readily to other research and clinical settings.

CONCLUSION

Although socioeconomic deprivation was not independently associated with increased mortality within 180 days of acute hip fracture, the significantly lower age at which deprived patients sustain their hip fracture may confer a greater risk of dying at an earlier age. Readmission rates were higher in the most deprived quintile, but return to independent living, COVID-19 status during admission, and length of stay were not influenced by deprivation.

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Table 1 – Case-mix variables of the study cohort (n=1822)

Case-mix variable	Total (n=1822)	%
Sex		
Male	516	28.3%
Female	1306	71.7%
Fracture type		
Intracapsular	1046	57.4%
Extracapsular	776	42.6%
SIMD Quartile		
1 (least)	600	33.0%
2	311	17.1%
3	281	15.5%
4	407	22.4%
5 (most)	217	11.9%
missing	6	0.1%
ASA grade		
I	38	2.1%
II	457	25.1%
III	1138	62.5%
IV	164	9.0%
V	25	1.4%
COVID during admission		
No	1701	93.4%
Yes	121	6.6%

Table 2. Multivariate logistic regression analysis of SIMD quintile as a predictor of mortality at 30 and 180 days when adjusting for age and sex. *p*-values represent Wald chi-squared test.

Demographic	30-day mortality				180-day mortality			
	Overall mortality		Odds ratio (95% CI)	*p* value	Overall mortality		Odds ratio (95% CI)	*p* value
	Alive (n=1691)	**Dead (n=131)**			**Alive (1480)**	**Dead (n=342)**		
SIMD								
1 (least)	547 (91%%)	53 (9%)	reference	n/a	465 (78%)	135 (22%)	reference	n/a
2	294 (95%%)	17 (5%)	0.60 (0.34-1.08)	0.087	259 (83%)	52 (17%)	0.70 (0.49-1.08)	0.057
3	265 (94%)	16 (6%)	0.67 (0.37-1.20)	0.174	252 (90%)	29 (10%)	0.42 (0.27-0.64)	0.000
4	376 (92%)	31 (8%)	0.96 (0.60-1.54)	0.872	323 (79%)	84 (21%)	1.04 (0.76-1.43)	0.808
5 (most)	203 (94%)	14 (6%)	0.84 (0.45-1.56)	0.574	175 (81%)	42 (19%)	1.01 (0.67-1.52)	0.957
missing	6 (100%)	0 (0%)	n/a	n/a	6 (100%)	0 (0%)	n/a	n/a
Age (mean, SD)	80.4 (10.1)	84.3 (9.7)	1.05 (1.03 – 1.07)	<0.00	79.9 (10.1)	84.5 (9.1)	1.06 (1.05- 1.08)	<0.00
Sex								
female	1229 (94%)	77 (6%)	reference	n/a	377 (73%)	139 (27%)	reference	n/a
male	462 (90%)	54 (10%)	2.13 (1.47-3.01)	<0.00	1103 (85%)	203 (15%)	2.43 (1.88-3.14)	<0.00

Table 3. Chi-Squared analysis for mortality at 30 and 180 days according to SIMD quintile.

	30-day mortality			180-mortality		
	Alive	**Dead**	*p*-value	**Alive**	**Dead**	*p*-value
SIMD						
1 (least)	547 (91.2%)	53 (8.8%)	0.285	465 (77.5%)	135 (22.5%)	0.00
2	294 (94.5%)	17 (5.5%)		259 (83.3%)	52 (16.7%)	
3	265 (94.3%)	16 (5.7%)		252 (89.7%)	29 (10.3%)	
4	376 (92.4%)	31 (7.6%)		323 (79.4%)	84 (20.6%)	
5 (most)	203 (93.5%)	14 (6.5%)		175 (80.6%)	42 (19.4%)	
Total	1685 (92.8%)	131 (7.2%)		1474 (81.2%)	342 (18.8%)	

Figure 1. Kaplan-Meier survival curve analysis of the most deprived two quintiles (blue) versus the least deprived two quintiles (red) (log-rank (Mantel-Cox) p=0.854)

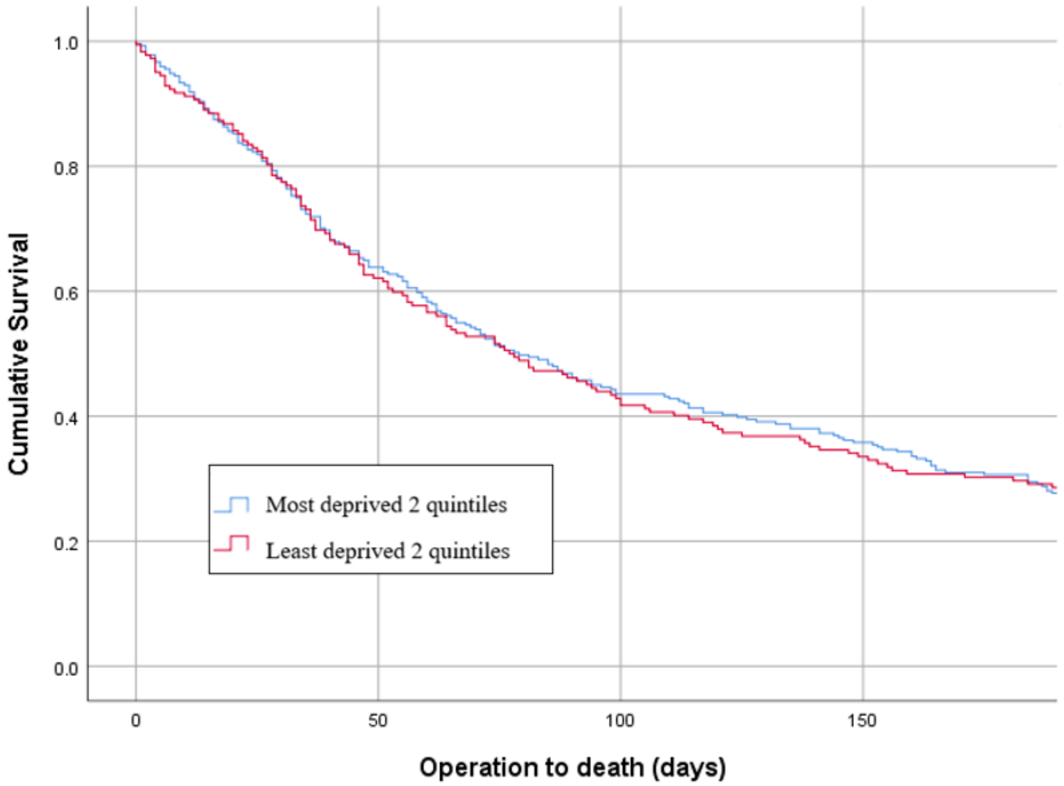

Table 4. Mean age at time of hip fracture according to SIMD quintile. One-way ANOVA. (n=1816)

SIMD	N	Mean	Std. Deviation	95% Confidence Interval for Mean: Lower Bound	95% Confidence Interval for Mean: Upper Bound	*p* value
1 (least)	600	82.77	9.330	82.02	83.51	<0.000
2	311	81.50	9.447	80.45	82.56	
3	281	80.29	9.432	79.18	81.40	
4	407	79.38	10.726	78.34	80.43	
5 (most)	217	77.18	11.096	75.70	78.66	
Total	1816	80.74	10.075	80.28	81.20	

Table 5. Linear regression model adjusted for sex and age at time of hip fracture according to SIMD quintile. (n=1816)

Variable	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	*p*-value
(Constant)	78.667	.984		79.907	.000
Sex (male)	2.300	.514	.103	4.470	.000
SIMD					
1 (least)	reference	n/a	n/a	n/a	n/a
2	-1.122	.689	-.042	-1.629	.103
3	-2.271	.713	-.081	-3.185	.001
4	-3.236	.633	-.134	-5.113	.000
5 (most)	-5.293	.783	-.170	-6.763	.000

Dependent Variable: Age

Figure 2. Line graph of mean age of hip fracture according to SIMD quintile (1 = least deprived). Error bars represent 95% confidence intervals.

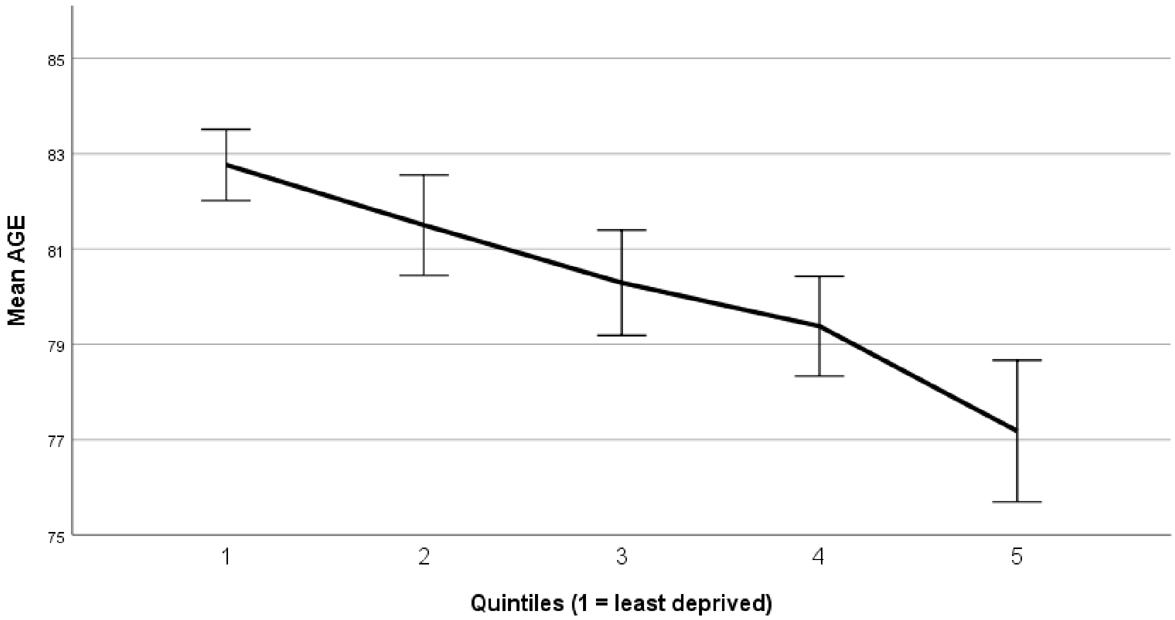

Table 6. Multivariate logistic regression analysis of SIMD quintile as a predictor of contracting COVID during admission when adjusting for age and sex. *p* values represent Wald chi-squared test.

	Contracted COVID during admission		Odds ratio (95% CI)	*p* value
	Yes (121)	**No (1701)**		
SIMD				
1	47 (8%)	553 (92%)	reference	n/a
2	15 (5%)	296 (95%)	0.51 (0.24 – 1.01)	0.073
3	19 (7%)	262 (93%)	0.97 (0.52 – 1.82)	0.927
4	27 (7%)	380 (93%)	0.85 (0.47 – 1.52)	0.586
5 (most)	13 (6%)	204 (94%)	0.96 (0.47 – 1.94)	0.902
missing	0 (0%)	6 (100%)	n/a	n/a
Age (mean, SD)	82.6 (9.1)	80.6 (10.1)	1.01 (0.99 – 1.04)	0.253
Sex				
female	83 (6%)	1223 (94%)	reference	n/a
male	38 (7%)	478 (93%)	0.98 (0.60 – 1.59)	0.936

Table 7. Multivariate logistic regression analysis of SIMD quintile as a predictor readmission to an acute hospital (n=1821) and return to home (n=1284) when adjusting for age and sex. *p*-values represent Wald chi-squared test.

	Readmitted during study period (n=1821)		Odds ratio (95% CI)	*p* value	Returned to home on discharge (n=1384)		Odds ratio (95% CI)	*p* value
	Yes (735)	**No (1087)**			**Yes (531)**	**No (853)**		
SIMD								
1 (least)	222 (37%)	378 (63%)	reference	n/a	175 (41%)	254 (59%)	reference	n/a
2	129 (41%)	182 (59%)	1.21 (0.92-01.60)	0.179	88 (37%)	151 (63%)	.86 (0.61-1.20)	.372
3	118 (42%)	163 (58%)	1.24 (0.93-1.66)	0.143	78 (34%)	151 (66%)	.815 (0.58-1.15)	.245
4	161 (40%)	246 (60%)	1.13 (0.87-1.46)	0.371	127 (41%)	183 (59%)	1.218 (0.89-1.66)	.215
5 (most)	105 (48%)	112 (52%)	1.63 (1.18-2.24)	0.003	61 (36%)	110 (64%)	1.10 (0.74-1.62)	.641
missing	0 (0%)	6 (100%)	n/a	n/a	2 (33%)	4 (67%)	n/a	n/a
Age (mean, SD)	80.8 (9.2)	80.7 (10.6)	1.00 (0.99-1.01)	0.519	77.4 (10.4)	82.9 (9.1)	1.06 (1.05-1.08)	0.000
Sex								
female	526 (40%)	780 (60%)	reference	n/a	381 (38%)	617 (62%)	reference	n/a
male	209 (41%)	307 (59%)	1.00 (0.81-1.23)	0.982	150 (39%)	236 (61%)	1.22 (0.95-1.57)	.128