The consequences of living on a low income in Scotland's island communities

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1   Key points

This report sets out the findings from analysis of the Scottish Household Survey, investigating the relationship between income, living costs and various social and economic outcomes affecting households in Shetland, Orkney and the Western Isles, as compared to the rest of Scotland.

The analysis set out to investigate whether, in these island groups, where living costs are higher than in the rest of Scotland, households are being disadvantaged to a greater extent than suggested by their relatively favourable income profile.

Looking at a range of indicators, the analysis identifies three different ways in which this is the case in Shetland, with more mixed results in Orkney and the Western Isles:

1) Based on the Scottish Household Survey, it finds that while Shetlanders have relatively high incomes on average and a relatively small proportion experience financial difficulties, their chance of saying they are doing well financially is much lower than most Scots with similar characteristics. Specifically, once we take account of household income and local area characteristics (such as unemployment rates) people in Shetland have the fourth-highest chance of financial difficulties of any Scottish local authority. If income is adjusted for the higher living costs in Shetland, however, financial well-being relative to income is closer to the Scottish average.

   These results do not however apply to Orkney and the Western Isles, whose residents have relatively high likelihood of coping well financially, relative to their income and area profiles, despite higher costs.

   The indicator producing these findings defines households as having 'financial constraint' if they report not doing well financially. This provides the most robust results in this report: it shows whether people's incomes put them in a good financial position relative to their needs. Scotland-wide evidence on financial constraint shows a close link between doing badly on this indicator and negative social outcomes. For example, someone who is financially constrained in the terms measured here is up to twice as likely to be in poor health and up to ten times as likely to experience material deprivation compared to someone who is not financially constrained.

2) Further survey evidence from the Annual Population Survey corroborates the above results, by showing that in Shetland, households are more likely to report only low to medium life satisfaction, happiness or self worth, or medium to high anxiety, than would be predicted from their local economic profile (in this case using unemployment as the explanatory variable). These results are not repeated in Orkney or the Western Isles, both of which have low unemployment and correspondingly low levels of households reporting negative aspects of well-being.

3) A third source of significant results was local data on social outcomes by small area, obtained from the Scottish Index of Multiple Deprivation. This shows four outcomes that are worse in Shetland than would be suggested by its income profile: higher mortality rates, lower rates of entry into higher education and high rates of hospitalisation for both alcohol and drug use. For example, despite having the highest average income out of 32 Scottish local authorities, Shetland has only the 13th highest life expectancy and the 25th highest rate of higher education entry. Two of these outcomes, alcohol-related hospital stays and entry to higher education, also show less favourable results than predicted by income in Orkney and the Western Isles, but mortality rates and drug-related hospital stays are no worse, and in some cases better, in these island groups than predicted by income.

Overall, these results show that Shetland has worse social outcomes on a number of measures than would be predicted by its socioeconomic profile, but this is not evident for the other island groups. High living costs may contribute to the Shetland results, although they are not producing the same results in Orkney and the Western Isles, which also have high living costs. However, whatever the cause, this evidence suggests that in Shetland's case, judging the level of social need by socio-economic indicators such as income, unadjusted for the higher cost of living, could seriously underestimate needs relative to other areas of Scotland.

2   Analysis of household survey data

In this report, we distinguish between analysis on the one hand of household surveys and on the other of local administrative data. The surveys show the extent to which the pattern of individual households' outcomes, such as financial well-being, are what we would expect, given the profile of household incomes. The administrative data show the incidence of certain phenomena, such as death rates and percentage of people entering higher education, within a geographical area, and this can also be compared to what one would expect based on the socio-economic profile of the area. We analysed two surveys: the **Scottish Household Survey (SHS)** and **the Annual Population Survey (APS),** and, for area based administrative data, the **Scottish Index of Multiple Deprivation.**

2.1 Scottish Household Survey

Data

The **SHS** is a continuous, cross-sectional survey based on a random sample of the general population in private residences in Scotland (The Scottish Government and Ipsos Mori, 2020). The survey includes a minimum of 250 households for each local authority, with a total sample size in 2017 (the most recent wave at the time of writing) of 10,658 households.

To increase the sample sizes for subsequent analysis at local authority level, we pool four waves of the survey (2014-2017), resulting in a total sample size of 42,038 households. However, due to the way in which income information is collected, households with additional adults outside the primary family unit are excluded, as total household income cannot be calculated. This reduces the overall sample size to 33,797 households. Table 1 shows the number of households in each local authority that can potentially be included in the analyses. There are at least 800 households in the majority of local authorities, with more than 2,000 in the large cities of Edinburgh and Glasgow. The sample sizes may decrease in some analyses due to non-response to specific questions in the survey. However, there are sufficient sample sizes to carry out a range of statistical analyses.

Table 1   Number of households by local authority, SHS 2014-2017

Local authority	Number of households	% of total sample
Aberdeen City	1,019	3.02
Aberdeenshire	1,021	3.02
Angus	875	2.59
Argyll and Bute	890	2.63
City of Edinburgh	2,470	7.31
Clackmannanshire	916	2.71
Dumfries and Galloway	811	2.4
Dundee City	871	2.58
East Ayrshire	795	2.35
East Dunbartonshire	808	2.39
East Lothian	860	2.54
East Renfrewshire	809	2.39
Falkirk	929	2.75
Fife	1,778	5.26
Glasgow City	2,932	8.68
Highland	1,057	3.13
Inverclyde	871	2.58
Midlothian	775	2.29
Moray	879	2.60
Na h-Eileanan Siar	842	2.49
North Ayrshire	821	2.43
North Lanarkshire	1,475	4.36
Orkney Islands	886	2.62
Perth and Kinross	885	2.62
Renfrewshire	899	2.66
Scottish Borders	857	2.54
Shetland Islands	870	2.57
South Ayrshire	908	2.69
South Lanarkshire	1,366	4.04
Stirling	882	2.61
West Dunbartonshire	909	2.69
West Lothian	831	2.46
TOTAL	**33,797**	**100**

Table 2 shows the overall sample sizes for different household types. Working age households without children (either singles or couples) make up the largest percentage of the population, while lone parents are the least numerous, representing just 6% of the total population.

Table 2   Number of households by household type, SHS 2014-2017

Core household type	Number of households	% of all households
Working age couple	7,044	20.84
Pension age couple	4,688	13.87
Couple with children	5,736	16.97
Lone parent	2,028	6.00
Working age single	8,109	23.99
Pension age single	6,192	18.32

SHS outcome variables: financial well-being and material deprivation

The most useful outcome variable identified in this survey was **subjective financial wellbeing,** based on responses to the following question:

"Taking everything together, which of the phrases on this card best describes how you and your household are managing financially these days?"
1.   Manage very well
2.   Manage quite well
3.   Get by alright
4.   Don't manage very well
5.   Have some financial difficulties
6.   Are in deep financial trouble

This measure is widely used as an indicator of subjective financial wellbeing and provides a useful insight into whether a particular level of income actually provides a household with enough to manage financially in different circumstances.

For the purposes of the study, we collapse the responses into two categories as follows:[1]

1.	Manage very well	**Managing well**
2.	Manage quite well	
3.	Get by alright	
4.	Don't manage very well	**Financial constraint**
5.	Have some financial difficulties	
6.	Are in deep financial trouble	

Material deprivation is defined based on a series of questions regarding the extent to which households can afford a range of different commodities. There are 22 specific questions, one set referring to the households and a second set referring specifically to the needs of children in the household. The questions are detailed in Box 1.

If a household reports that they do not have an item because they cannot afford it, this is considered to be a material deprivation. Drawing on previous research carried out to evaluate the discriminatory power of these questions (Scottish Government, 2017), we defined a household as materially deprived if they report three or more deprivations.

Since the material deprivation questions were first introduced in 2014, they have only been asked of households with dependent children in a one third of the total SHS sample. Therefore, sample sizes are much smaller for this outcome. However, by grouping the local authorities into larger categories, we are still able to achieve sample sizes large enough to carry out a subset of analyses using the pooled SHS data for 2014-2017 (see Table 3).

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[1]   This variable is often aggregated into three categories, with 'getting by alright' as a separate response. However, this option was problematic for the current analysis due to small sample sizes when stratifying by local authority. For example, in 2017 only 10 households in Shetland reported not managing well/being in financial difficulties (response 4-6). Adding the 'getting by alright' response increases this to 90 households. Looking at the pattern of households defined as 'not managing well' differs with or without the inclusion of category 3 shows that although there are some differences for specific local authorities, in general the pattern is broadly comparable. In particular, those areas in which we are particularly interested (the island local authorities) tend to fall in a similar position in the local authority ranking. The remaining analysis therefore uses the aggregation outlined above.

Box 1   Material deprivation questions, Scottish Household Survey

Household necessities ("Do you have..."):
- Enough money to save regularly (of at least £20) for rainy days?
- Enough money to repair/replace broken electrical goods?
- Enough money to make regular payments into an occupational or private pension? (only asked if someone in the household is aged 16-64)
- All recommended dental work/treatment?
- Enough money to keep your home in a decent state of decoration?
- Enough money to take part in sport/exercise activities or classes?
- Enough money to take part in a hobby or leisure activity?
- Appropriate clothes for job interviews? (only asked if someone in the household is aged 16-64)
- Home contents insurance?
- A damp free home?
- Access to £500 to cover an unexpected, but necessary, expense?

Child necessities:
- Does your child have money to save?
- Does your child have a holiday away from home at least once a year?
- Does your child have day trips with family once a month?
- Does your child have access to a computer and internet for homework?
- Does your child get pocket money?
- Does your child have a warm winter coat?
- Does your child have at least four pairs of trousers, leggings, jeans etc. ?
- Does your child have some new, not second-hand clothes?
- Is there a garden or outdoor space nearby where your child can play safely?
- Does your child attend toddler groups etc. at least once a week (pre-school age children only) ?
- Are there enough bedrooms for every child aged 10 or older of different sex to have their own bedroom?

Table 3   **Number of households with valid material deprivation responses, by local authority grouping, SHS 2014-2017**

Local authority group	Number of households	% of total households
Edinburgh	155	6.70
Glasgow	214	9.25
Fife	137	5.92
North Lanarkshire	120	5.19
South Lanarkshire	88	3.80
Highlands	172	7.43
Grampian	134	5.79
Tayside	192	8.30
Central	176	7.61
Dunbartonshire	119	5.14
Renfrewshire and Inverclyde	180	7.78
Ayrshire	150	6.48
Lothian	195	8.43
Southern Scotland	102	4.41
Islands	180	7.78
Total	**2,314**	**100**

SHS Explanatory variables: What explains variation in outcomes between areas?

To answer the questions that are the focus of this report, we need to measure both income and living costs, and their relationship with financial wellbeing/material deprivation.

Income is measured at a household level, after housing costs and equivalised for household composition. To measure variation in living costs, we use the **Minimum Income Standard (MIS)** household budgets. MIS produces budgets for different household types, based on what members of the public think you need for a minimum acceptable standard of living in the UK. Previous work in remote and rural Scotland suggests that the minimum socially acceptable cost of living is up to one third higher in these areas, compared with urban areas of Britain (Hirsch et al., 2013). To estimate the impact of increased living costs on the Scottish Islands, we first adjust the MIS budgets for each family type to reflect these higher costs. In the original research, separate budgets were calculated for different types of neighbourhood (Town; Accessible to town; Inaccessible to town; Remote from town). However, in the SHS this level of detail about area of residence is not available so we take the average budget for different area types for each region. Table 4 shows the average percentage increase in MIS budget for different household types in the Western Isles and Northern Isles regions.

Table 4   Increase in MIS budget accounting for higher living costs in Scottish Islands

Household type	% above standard MIS budget	
	Western Isles	Northern Isles
Working age couple	23.6%	32.1%
Pension age couple	22.6%	23.8%
Couple with children	30.9%	42.7%
Lone parent	17.7%	21.4%
Working age single	33.7%	45.9%
Pension age single	32.3%	33.9%

Using these adjusted budgets, we calculate two different measures. First, whether a household's income places them above or below the MIS threshold budget for their household type; and second, the residual income minus the MIS budget (with those below MIS having a negative value).

We also add a number of control variables to our explanatory analyses, including housing tenure, household composition, household work status, and three variables at local authority level – job density, claimant count, and average house prices. These variables are likely to be of particular relevance in relation to young adults in Scotland's Island communities – previous research indicates that young people are concerned about the poor economic opportunities that they perceive to be available in the region, lack of local access to access further and higher education in their local areas, and the lack of affordable housing (Highlands and Islands Enterprise, 2009; Skerratt, S., Atterton, J., Brodie, E., McCracken, D., Thomson, S., Woolvin, 2014). Using these data, we carry out a series of regression models to assess the relationship between income, living costs and financial wellbeing/material deprivation.

Results for subjective financial wellbeing

Figure 1 shows the percentage of households that report poor/fair financial wellbeing. Relative to the 44% who report this in Scotland as a whole, the three local authorities comprising island groups are all doing relatively well: Orkney has the lowest percentage out of all local authorities (31%) and for Eileanan Siar (37%) and Shetland (38%) it is significantly below average. This is not unexpected, as these three island groups tend to be classified as relatively advantaged in other measures of socioeconomic status such as child poverty (End Child Poverty, 2019). However, these comparisons do not take the composition and context of the population in different areas into account.

Figure 1   Percentage of households reporting financial constraint by local authority, SHS 2014-2017
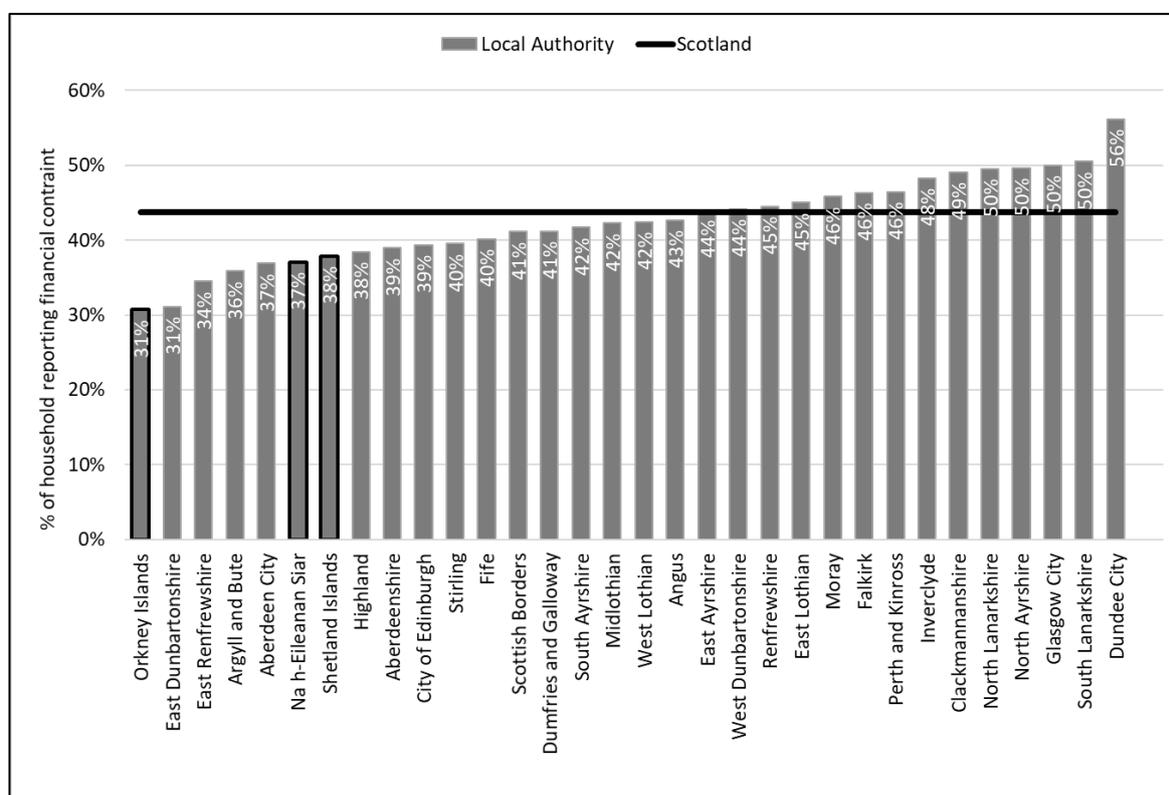

Table 5 shows the median weekly income after housing costs for local authority populations overall, and for two of the most common household types in the survey: single working age adults, and couples with children. Households in the Shetland Islands have the second highest median income among the local authorities, and the third and fourth highest incomes among single working age adults and couples with children, respectively. Orkney and Eileanan Siar on the other hand are closer to the Scotland average.

The strong relationship between income and self-reported financial wellbeing can be clearly observed in Figure 2, which plots the proportion of households in each equivalised household income centile that report financial constraint. As expected, the likelihood of

reporting financial constraint falls as income increases. Taken together, Table 5 and Figure 1 indicate that the relatively low rate of subjective financial constraint in Shetland, as shown in Figure 1, is in part explained by the relatively high incomes of households in this local authority. This however is less clearly the case with the other island groups, since income is closer to the average.

Table 5   Median weekly income after housing costs by local authority, SHS 2014-2017

Local authority	Median weekly income after housing costs		
	All households	*Single working age*	*Couple with 2 children*
Aberdeenshire	£495.86	£215.42	£689.66
Shetland Islands	£491.95	£243.10	£689.29
East Dunbartonshire	£483.60	£256.71	£760.84
East Renfrewshire	£462.64	£235.02	£912.64
Highland	£411.88	£225.29	£611.07
Aberdeen City	£408.62	£220.15	£652.18
East Lothian	£406.61	£187.74	£587.43
Moray	£406.13	£235.63	£633.91
Perth and Kinross	£404.39	£234.29	£627.59
South Lanarkshire	£398.47	£239.46	£579.41
Stirling	£395.40	£239.85	£618.08
West Lothian	£390.34	£197.32	£683.91
Midlothian	£390.11	£208.62	£562.09
Angus	£390.04	£235.25	£584.06
City of Edinburgh	£389.27	£239.04	£614.25
Orkney Islands	£387.82	£204.98	£649.50
Argyll and Bute	£382.84	£226.82	£676.55
Scottish Borders	£382.07	£210.73	£557.82
North Lanarkshire	£373.56	£219.92	£561.69
South Ayrshire	£373.56	£257.66	£545.59
Dumfries and Galloway	£371.65	£226.71	£577.28
Falkirk	£371.65	£193.10	£584.10
Na h-Eileanan Siar	£370.50	£200.00	£652.18
Renfrewshire	£368.95	£226.82	£655.56
Clackmannanshire	£367.82	£184.67	£563.45
East Ayrshire	£363.37	£234.00	£551.88
Fife	£361.49	£233.72	£621.93
North Ayrshire	£348.97	£227.97	£532.45
West Dunbartonshire	£336.40	£220.69	£527.89
Dundee City	£323.72	£233.49	£501.38
Glasgow City	£310.34	£219.35	£543.14
Inverclyde	£309.79	£215.67	£561.96
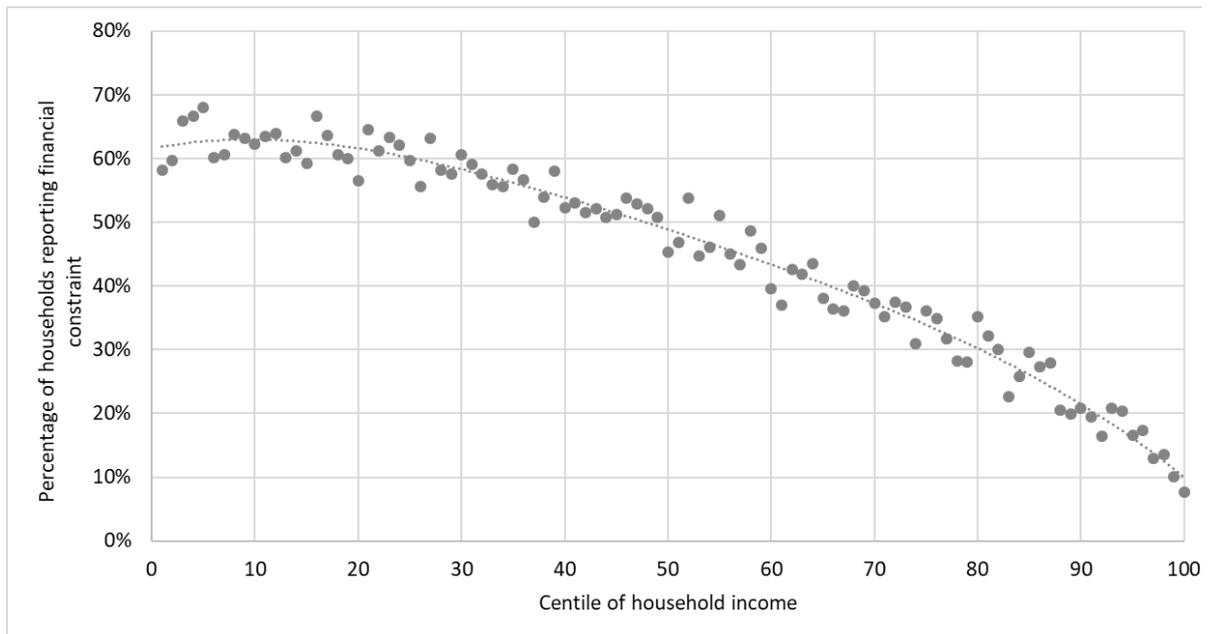
We also know that all these island groups differ from other areas of Scotland in terms of patterns of household composition and circumstances. Figure 3 shows the probability of a household reporting financial constraint by local authority, before and after taking differences in household characteristics into account using regression modelling. The model adjusts for differences in household income, household composition, household employment status and housing tenure. After taking these differences into account, the probability of a household reporting financial constraint increases in some local authorities and decreases in others. The Shetland Islands show one of the largest increases, rising from 38% to 44%, and moving from one of the local authorities where households were least likely to report financial constraint to near the middle of the distribution. Note that for Orkney and Eileanan Siar, there is no change in ranking once the adjustment is made: since they have incomes closer to the Scotland average than Shetland, they show lower than expected levels of financial constraint even when income is taken into account.

Figure 3   **Predicted probability of financial constraint by local authority, before and after adjustment for household characteristics**
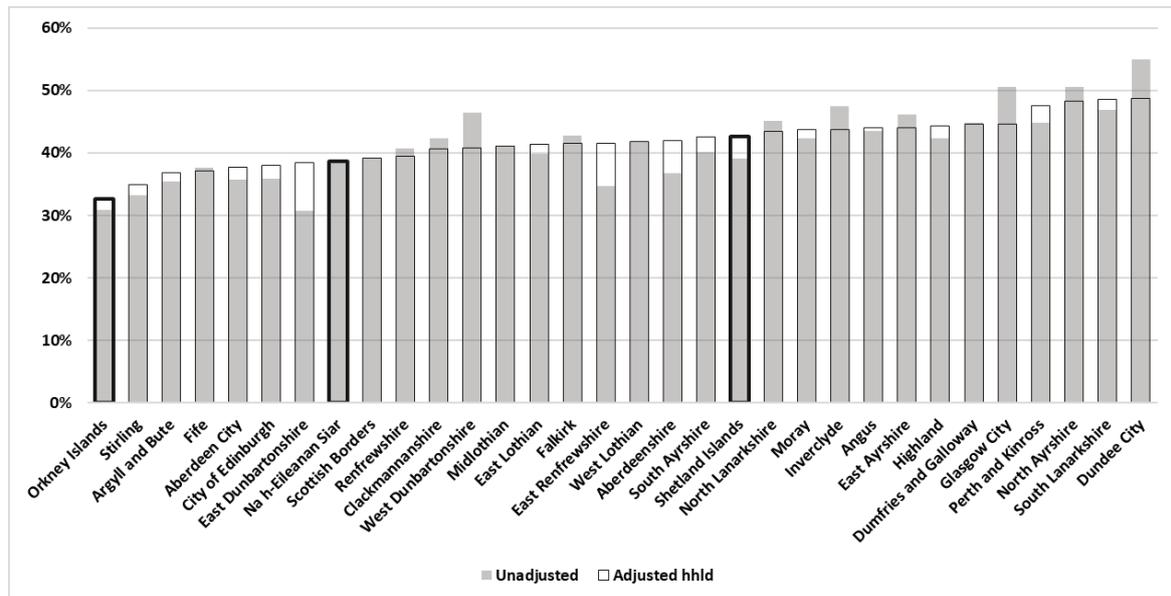

Figure 4 shows the results from a further regression model that includes adjustment for key area-level characteristics in addition to the household characteristics listed above, compared with the results after adjustment for household characteristics only. The analysis includes administrative data on unemployment rates, job density and house prices at local authority level. Overall, the changes are less substantial than those observed after adjustment for household characteristics, but the probability of a household reporting financial constraint in Shetland increases from 44% to 47%, with Shetland now showing the fourth highest probability across the local authorities. Here, there is also an adjustment for Orkney in the same direction, based on lower than average area-level deprivation, and an adjustment in the opposite direction for Eileanan Siar, based on above-average local deprivation, but neither of these has much effect on those authorities' adjusted rates of financial constraint, relative to other authorities: their ranks remain similar in Figure 4 to Figure 3.

Figure 4   Predicted probability of financial constraint by local authority, before and after adjustment for area-level characteristics
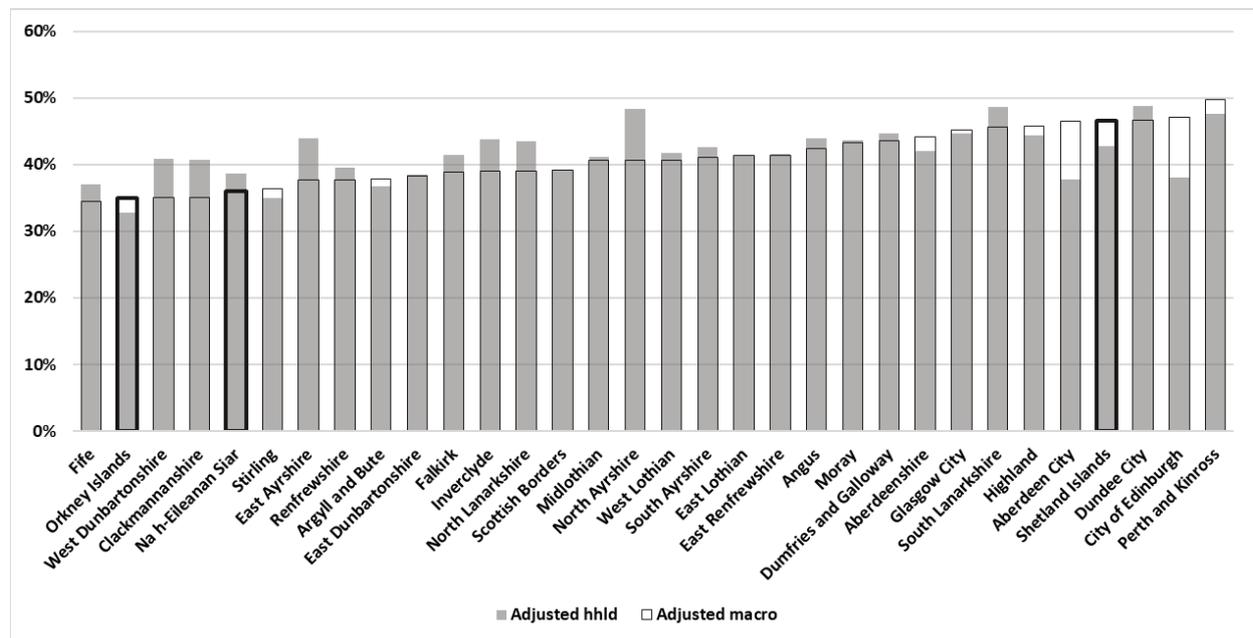
Impact of living costs: Minimum Income Standards

The previous analysis shows that the relatively low likelihood of households reporting financial constraint in Shetland, although not the other island authorities, can be explained by the characteristics of resident households and of the local region. The previous analyses do not, however, directly measure the impact of living costs. As noted in the methods section above, we use the MIS budgets for remote and rural Scotland to estimate the atypical living costs in the Scottish islands. To evaluate the effect of differential living costs on the probability of a household reporting financial constraint, we repeat the analysis shown in Figure 4, but include households' net income after subtracting the appropriate MIS budget, based on the remote/rural MIS for the islands, and standard MIS for the other local authorities, and a binary measure of whether a household is below MIS.

Figure 5 shows the results of this analysis. Taking living costs into account reduces the probability that a household in Shetland will report financial constraint back down to 42%, a decrease of five percentage points from 47% in the previous model. Shetland now has the 12th highest probability of a household reporting financial constraint, down from fourth. This can be interpreted as suggesting that, all other things being equal, if living costs were constant across all local authorities the relative probability of a household reporting financial constraint in Shetland would decrease. Similarly for Orkney and Eileanan Siar, where higher costs based on MIS also apply, Figure 5 suggests that without these costs they would have lower financial constraint – with the most favourable results for all Scottish local authorities.

Figure 5   Predicted probability of financial constraint by local authority, before and after adjustment for income after MIS

Analysis by household type

To further investigate the role of household composition in the relationship between income, living costs and financial wellbeing, we repeated the analyses separately for six core family types:
1.   Working age couples
2.   Pension age couples
3.   Couples with children
4.   Lone parents
5.   Working age singles
6.   Pension age singles

Unfortunately, the sample sizes for lone parents were not large enough to carry out analyses by local authority so for this family type, grouped local authorities were used instead.

Table 6 shows the percentage of households reporting financial constraint in each local authority for each of the six household types. In Scotland as a whole and in every local authority, lone parents are most likely to report financial constraint. Couples with children and single working age people also tend to have relatively high rates of financial constraint.
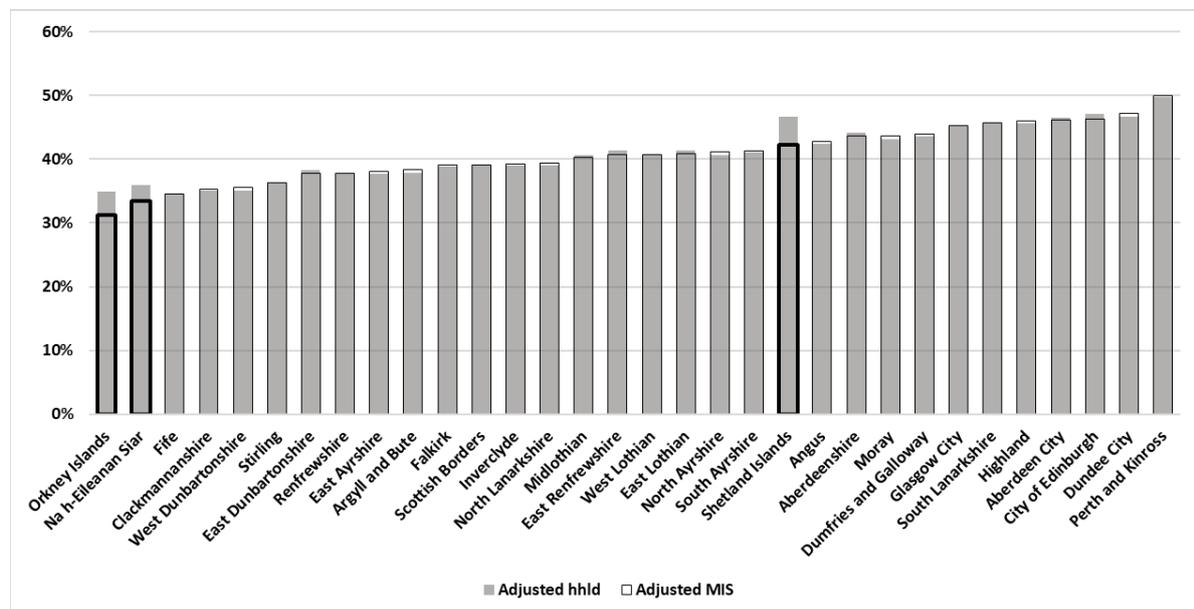
Table 6   **Percentage of households reporting financial constraint by family type, SHS 2014-2017**

Local authority	Percentage of households reporting financial constraint					
	Working age couple	*Pensioner couple*	*Couple with children*	*Lone parent*	*Working age single*	*Pensioner single*
SCOTLAND	31.7%	26.4%	46.9%	75.3%	54.3%	35.0%
Aberdeen City	25.4%	20.0%	41.5%	60.7%	46.2%	32.3%
Aberdeenshire	27.2%	27.4%	38.4%	60.7%	47.0%	45.7%
Angus	27.1%	29.4%	46.1%	82.6%	59.7%	40.8%
Argyll and Bute	32.0%	19.7%	42.3%	78.1%	45.2%	28.5%
City of Edinburgh	25.8%	21.3%	40.1%	70.1%	45.1%	28.4%
Clackmannanshire	32.1%	17.6%	47.1%	75.5%	56.5%	42.4%
Dumfries and Galloway	44.2%	28.3%	47.6%	72.6%	62.7%	36.6%
Dundee City	44.2%	31.1%	63.6%	82.6%	65.4%	44.1%
East Ayrshire	43.3%	26.8%	48.1%	74.4%	66.0%	28.1%
East Dunbartonshire	21.5%	20.8%	37.5%	75.6%	50.5%	17.3%
East Lothian	30.2%	18.4%	54.6%	68.2%	54.2%	33.7%
East Renfrewshire	24.7%	21.5%	41.8%	82.6%	58.6%	24.9%
Falkirk	32.7%	24.3%	52.0%	75.5%	53.9%	30.1%
Fife	29.4%	17.9%	43.8%	68.0%	51.3%	27.3%
Glasgow City	36.1%	39.5%	50.4%	80.0%	59.3%	41.9%
Highland	29.2%	28.1%	50.5%	78.1%	55.6%	40.6%
Inverclyde	35.6%	28.5%	47.8%	82.6%	60.0%	36.6%
Midlothian	33.3%	22.9%	52.6%	68.2%	47.4%	35.2%
Moray	31.6%	31.9%	51.1%	78.1%	52.4%	32.5%
Na h-Eileanan Siar	25.9%	31.0%	43.7%	57.0%	46.7%	38.6%
North Ayrshire	38.9%	30.5%	63.5%	74.4%	61.1%	43.4%
North Lanarkshire	34.8%	32.9%	46.4%	78.4%	54.4%	37.0%
Orkney Islands	25.9%	17.9%	35.4%	57.0%	45.2%	24.3%
Perth and Kinross	33.2%	32.4%	47.8%	82.6%	62.1%	42.1%
Renfrewshire	27.4%	25.1%	42.3%	82.6%	53.1%	29.1%
Scottish Borders	33.4%	24.5%	51.7%	72.6%	50.2%	33.1%
Shetland Islands	33.8%	23.5%	38.0%	57.0%	51.3%	39.7%
South Ayrshire	30.5%	24.3%	47.5%	74.4%	58.3%	36.0%
South Lanarkshire	37.4%	33.5%	48.8%	81.6%	59.4%	39.8%
Stirling	16.6%	23.3%	37.5%	75.5%	52.1%	22.4%
West Dunbartonshire	35.3%	26.0%	54.4%	75.6%	64.6%	25.7%
West Lothian	33.5%	20.3%	51.7%	68.2%	49.8%	41.6%

Figure 6   **Percentage of households reporting financial constraint in Scotland and island authorities**
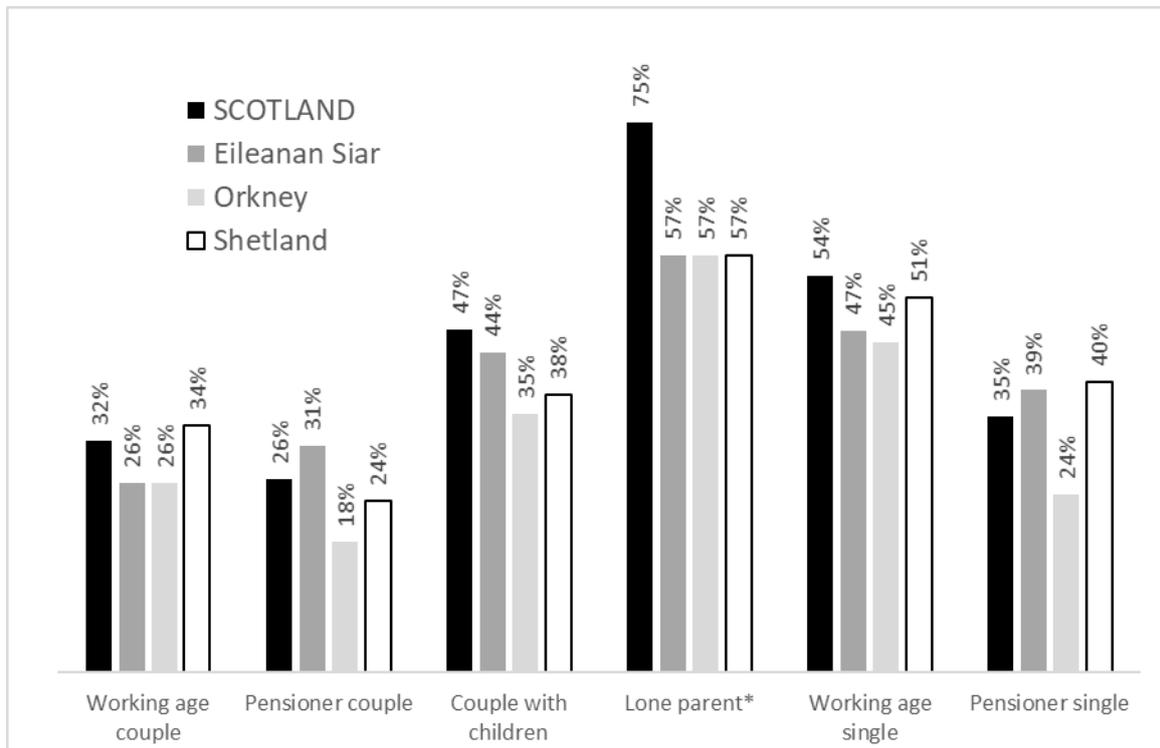
* Lone parent calculation combined for all three local authorities, due to small sample size

Figure 6 shows the results for Scotland as a whole compared with Shetland, Orkney and Eileanan Siar. This shows that whereas in most cases, and notably for families with children, households in these local authorities are less likely to live with financial constraint than the same kinds of households elsewhere in Scotland. However, there are notable exceptions to this pattern. In Eileanan Siar, both pensioner singles and pensioner couples are more likely than average to report these difficulties. This is also true for working age couples without children in Shetland, while working age singles without children have almost as great financial constraint as the Scotland average.

Figure 7 **Percentage of households reporting financial constraint in Scotland and Shetland, before and after adjustment for household characteristics, area-level characteristics and living costs (MIS)**
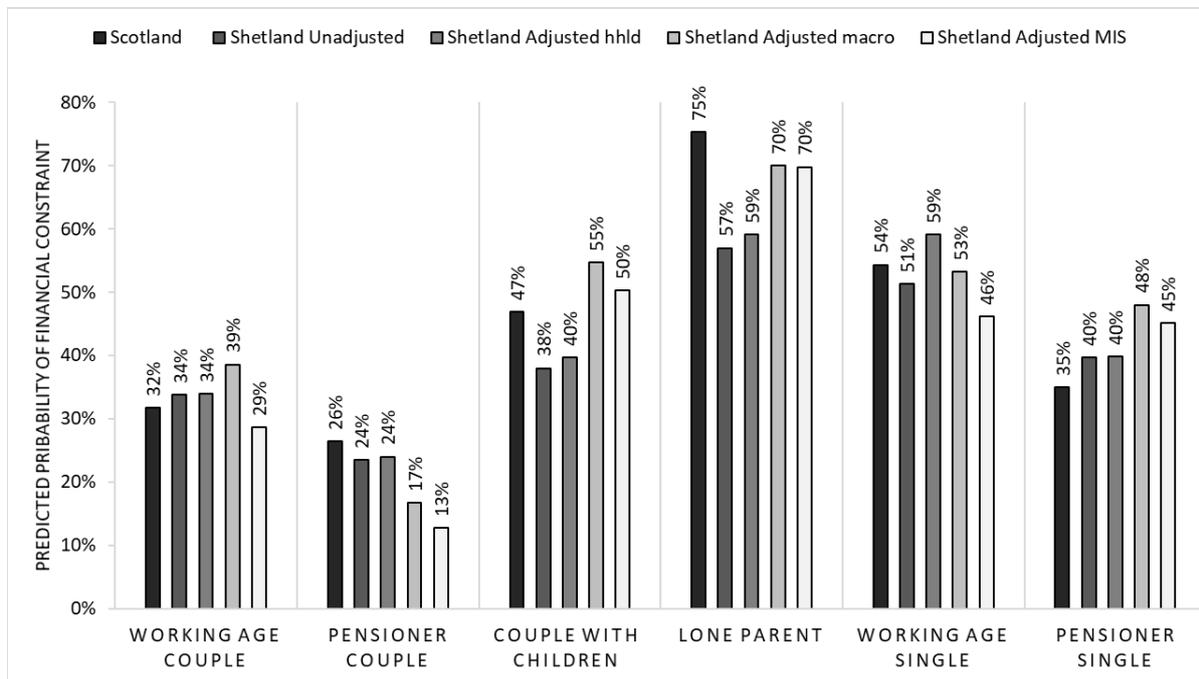

Figure 7 shows how these percentages change after adjustment for household characteristics, area-level characteristics and living costs measuring using MIS. (It shows this only for Shetland, since this is the authority where the previous analysis showed that such adjustments make a significant difference.) The results show that the effect of compositional factors and living costs varies considerably by household type. Working age singles are the only household type where taking household characteristics (income, work status and housing tenure) into account has a notable impact on their probability of financial constraint, rising from 51% to 59%, higher than the overall probability for Scotland (54%), although this falls to 53% with the inclusion of area-level effects. However, this falls further to 46% after account for living costs, suggesting that higher living costs have a particularly important effect for this group. Pensioner couples are the group least likely to report financial constraint, and this becomes even more pronounced in the adjusted models. In all of the other remaining groups, taking area-level characteristics (job density, unemployment rates and house prices) increases the probability that a household will report financial constraint. This can be explained by the fact that unemployment rates, for example, are relatively low in Shetland, which accounts for comparatively low probabilities of financial constraint for certain household types. In all household types apart from lone parents, adjusting for living costs results in a reduction in the probability of a household reporting financial constraint. The lack of effect for lone parents in part reflects that this group is highly likely to report financial constraint regardless of any other characteristics, and also relates to the fact that the differences between the standard and remote/rural MIS are smallest for this household type.

Results for material deprivation

Figure 8 shows the percentage of household classified as being materially deprived based on the material deprivation questions listed in Section 2.2, by grouped local authority.

Figure 8 **Percentage of households reporting material deprivation by local authority, SHS 2014-2017**
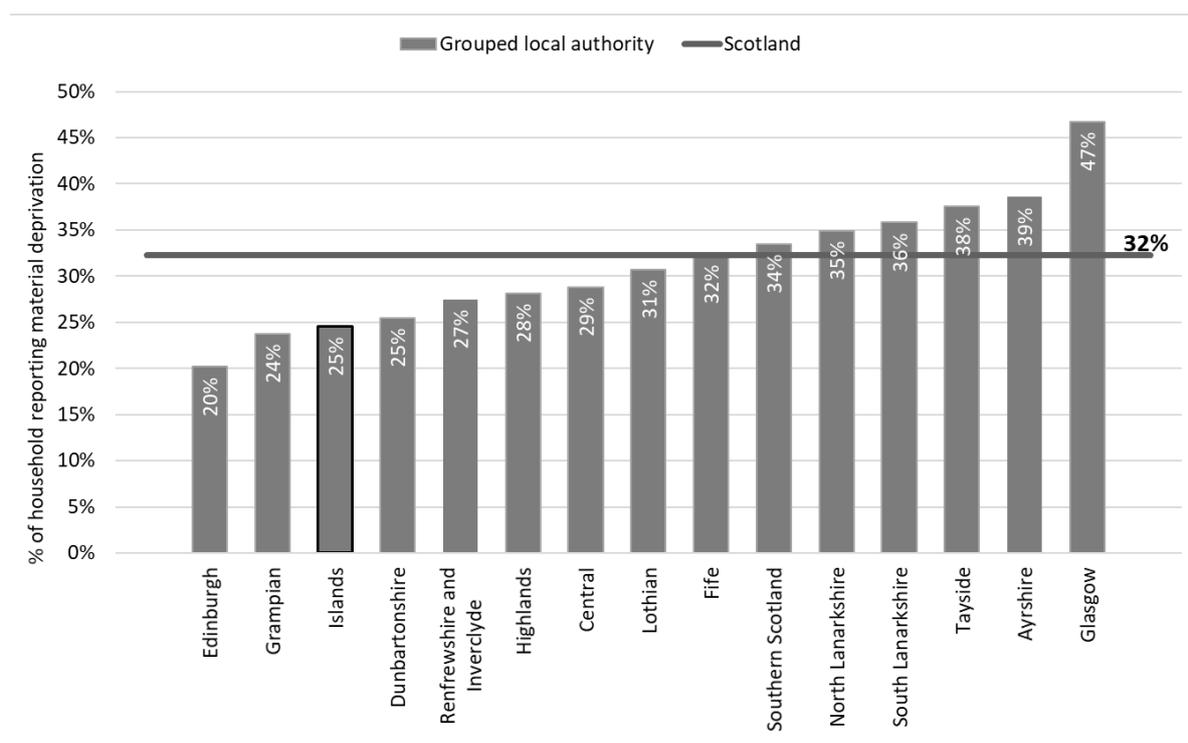
The usefulness of this indicator is limited by the smaller size of the sample, and it is only possible to look at results for the islands (Shetland, Orkney and the Western Isles) as a group. These show a relatively low concentration of materially deprived households, with 25% of households meeting the definition of material deprivation, compared with 47% in Glasgow – the most deprived area – and 32% in Scotland as a whole.

Figure 9 shows the effect of controlling for household characteristics, area-level factors and living costs in the same was as was done for financial well-being. However, in this case, controlling for these characteristics has only minor effects on the results. The risk of deprivation rises for the islands slightly when controlling for individual factors, but then falls to close to its unadjusted level when local area characteristics are factored in. Adjusting incomes for the effect of higher costs as reported in MIS also has only a minor effect.

Figure 9

Figure 9 **Predicted probability of material deprivation by local authority grouping, before and after adjustment for household circumstances, local area characteristics, and income after MIS, SHS 2014-2017**
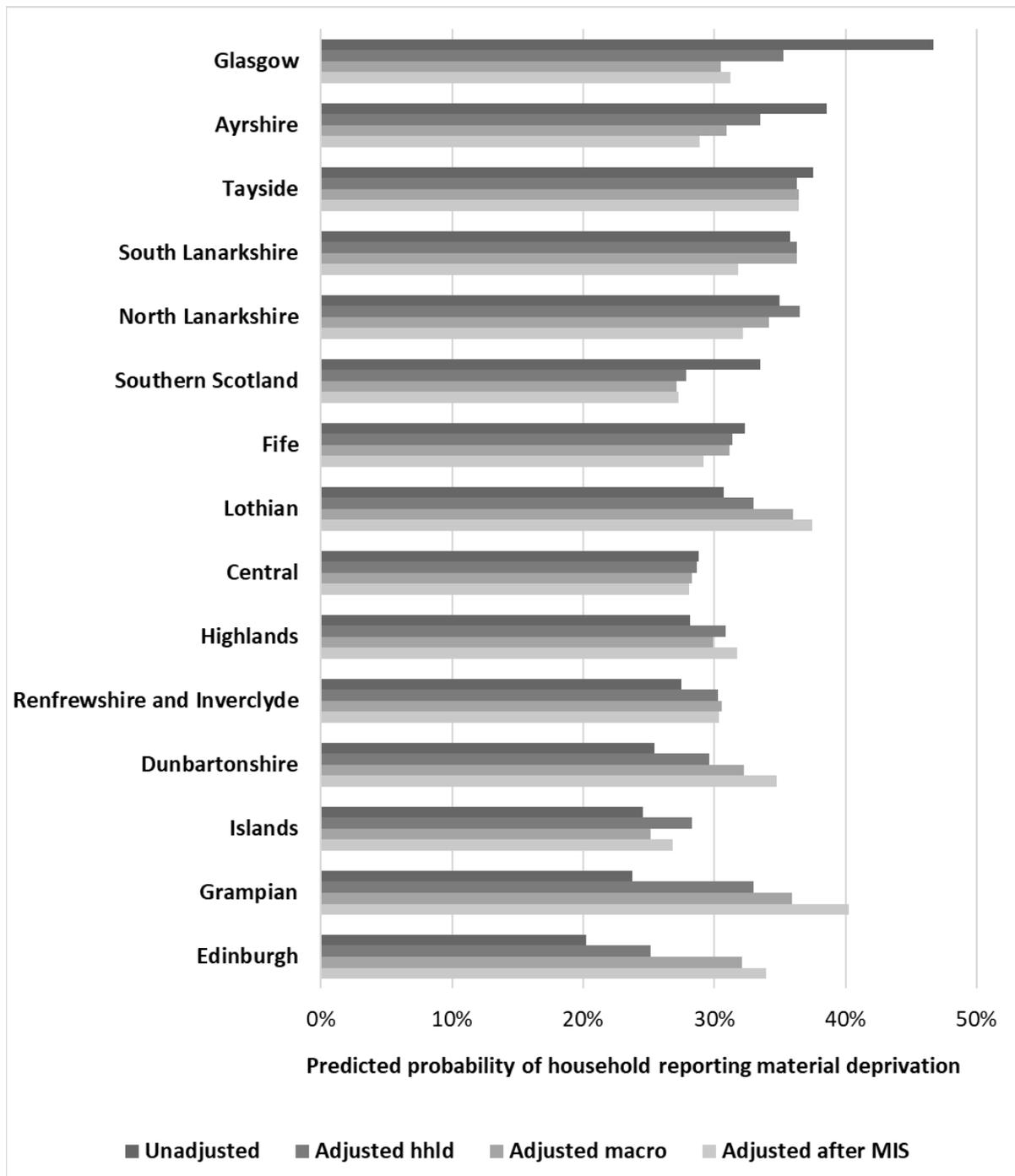
2.2 Annual Population Survey

The Annual Population Survey (APS) is a continuous household survey which provides a representative sample of those living in private residential households in the UK (ONS Social Survey Division, 2020). The survey uses data from the Labour Force Survey (LFS), aggregating 12 months of LFS data that are broken down on a quarterly basis. APS survey is the largest of any UK survey, with a sample size of approximately 320,000 respondents. This means that the data can be used to analyse social and socio-economic variables at relatively small levels of geography, down to local authority level.

We can therefore use the survey further examine the relationship between socioeconomic position and individual outcomes for households in Scotland's islands compared with the rest of the country. In particular, the APS includes measures of individual wellbeing that are not available in the SHS, allowing us to evaluate whether our findings from the latter are replicated for these additional outcomes. Here we use the data for 2019-20.

Personal wellbeing is measured in the APS using the following questions, with participants asked to give their response on a scale from 0 to 10, with 0 being 'not at all' and 10 'completely':

Life satisfaction	How satisfied are you with your life nowadays?
Worthwhile	To what extent do you feel that the things you do in your life are worthwhile?
Happiness	How happy did you feel yesterday?
Anxiety	How anxious did you feel yesterday?

These responses are dichotomised, with the resulting outcomes being the proportion of respondents reporting low/medium life satisfaction, worth or happiness, or reporting medium or high anxiety.

Unfortunately, the APS does not include a direct measure of household income, as it only records income from earnings and not from any other sources such as benefits. However, the ONS produce estimates of the unemployment rate at local authority level based on the APS, [2] which we use as a proxy for income levels in the subsequent analysis. At this level of geography, the APS unemployment rates correlates strongly with SIMD income domain (correlation coefficient=0.83), supporting its use as a reasonable proxy measure for income.[3]

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[2] http://www.ons.gov.uk/ons/guide-method/method-quality/specific/labour-market/subnational-labour/model-based-estimates-of-ilo-unemployment-for-lad-uas-in-great-britain---guide-for-users.pdf
[3] We also carried out sensitivity analyses substituting the APS unemployment rate with the SIMD income indicator score, and with median household income from the SHS at council area level. This produced results that were very similar to those using unemployment rates. We therefore report the results for APS unemployment rates to allow more direct comparison of indicators from the same data source.

Results from the APS

Figures 10 to 13 present the results from the APS, showing the relationship between unemployment and negative aspects of well-being. In all four of these graphs, residents of Shetland are shown as being much less likely to report a high level of well-being than would be predicted, given that it has the second lowest unemployment rate of all Scottish local authorities shown. In particular, Shetland has the sixth-highest percentage of people not reporting high life satisfaction of all Scottish local authorities. In contrast, Orkney, with the lowest unemployment rate, also has the most favourable well-being indicators on these measures. Eieanan Siar has the third lowest unemployment rate, and this is broadly reflected in the well-being indicators.

Figure 10   **Percentage of people reporting low or medium life satisfaction by local authority – observed and predicted values**
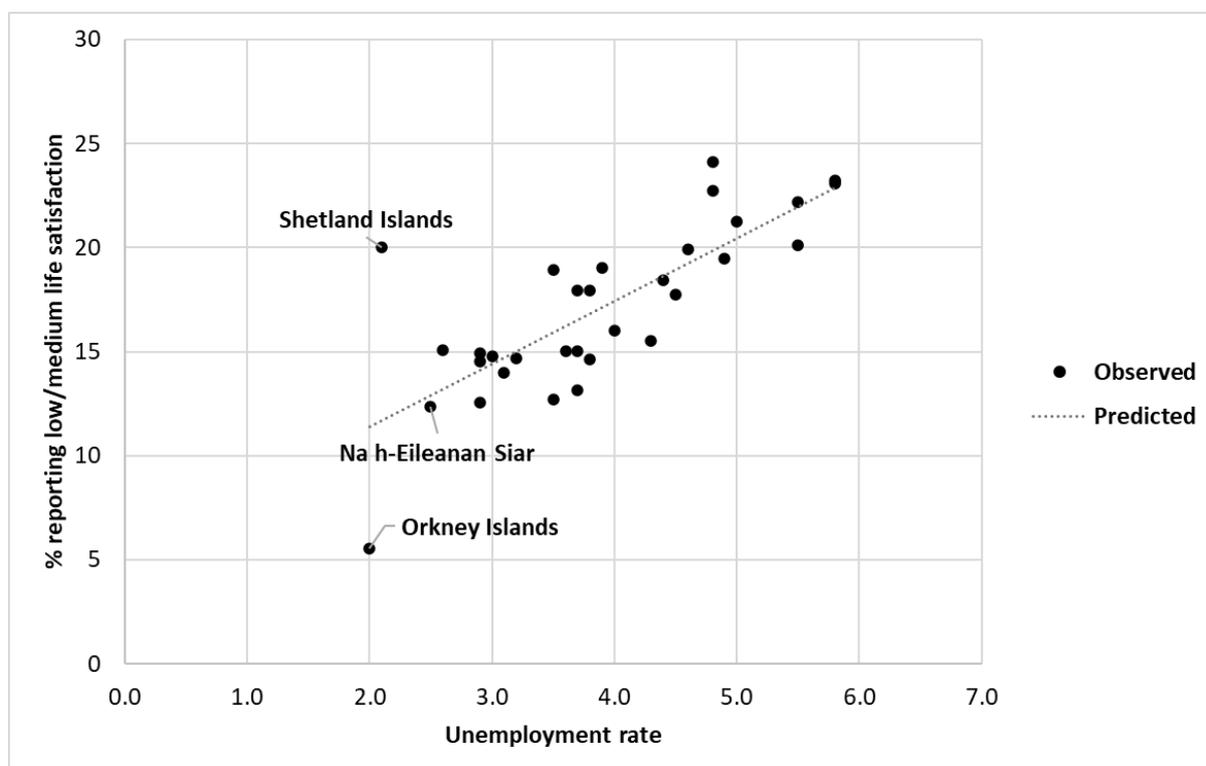

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Figure 11   Percentage of people reporting low or medium worth by local authority – observed and predicted values
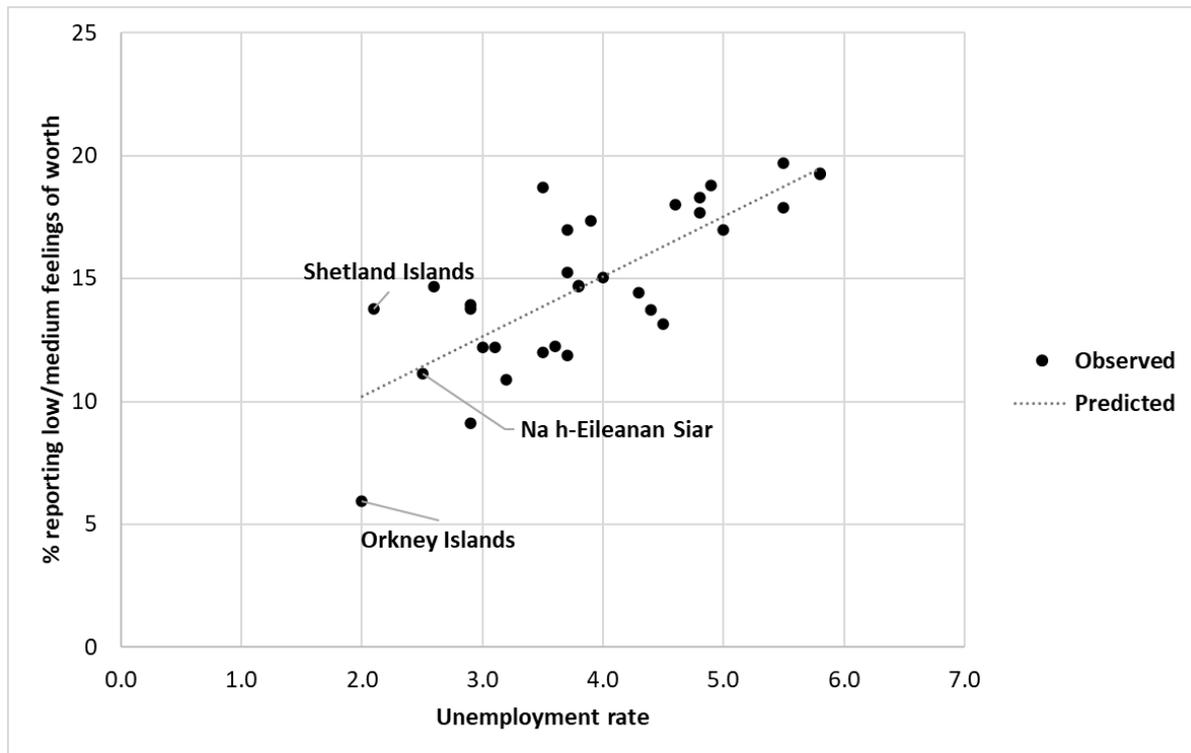

Figure 12   Percentage of people reporting low or medium happiness by local authority – observed and predicted values
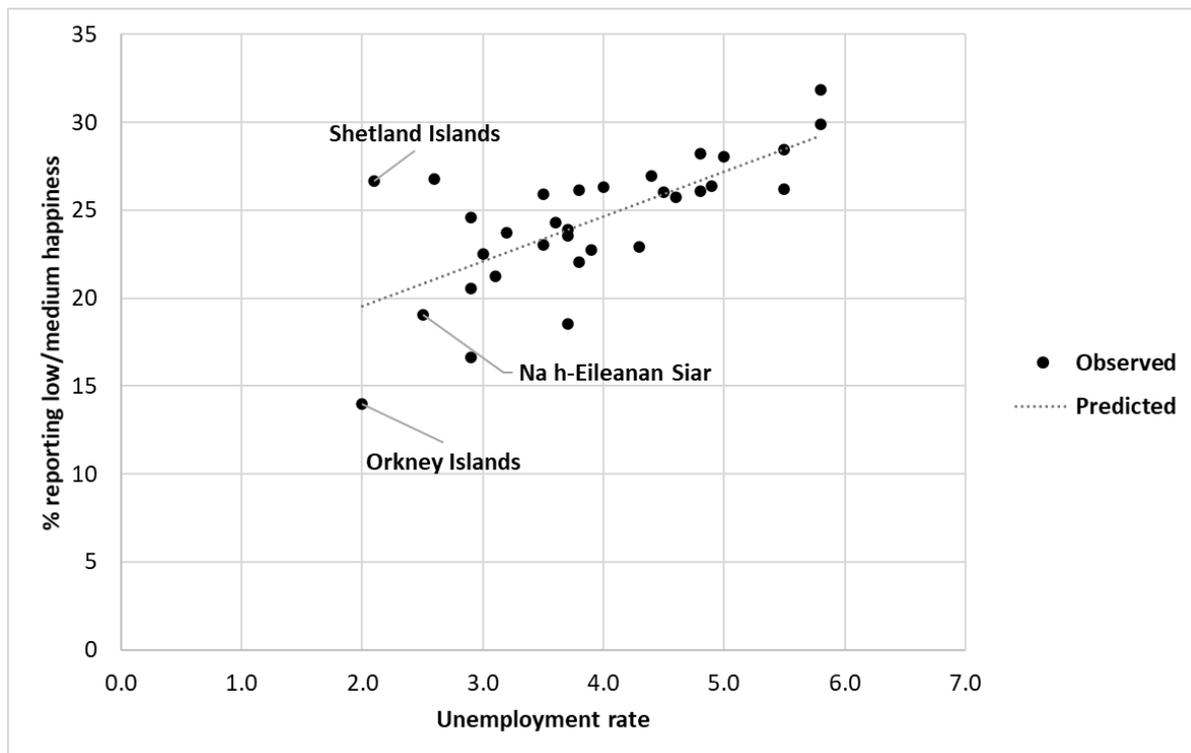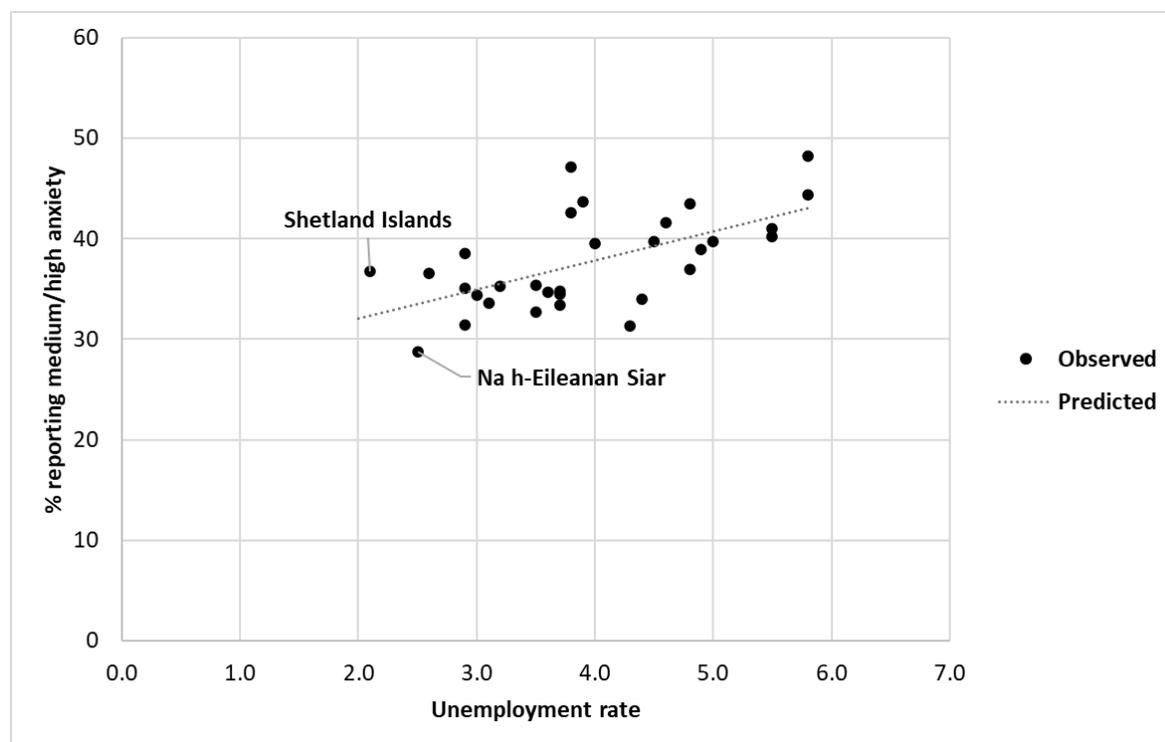
Figure 13   Percentage of people reporting medium or high anxiety by local authority – observed and predicted values[*]

[*]*Orkney is excluded from this analysis due to insufficient sample sizes*

2.3   Interpreting the results from household surveys

The above results suggest that the risks of low well-being, both financial and emotional, are substantially lower in Shetland than one would predict given its relatively high average income and low unemployment rate, whereas in Orkney and in Eileanan Siar, relatively favourable economic indicators correspond more to high levels of well-being.

Analysis shows that a substantial part of the difference between actual and expected outcomes in Shetland can be accounted for by higher costs. Clearly, however, it is not costs alone that are driving these results, since the other island groups, which also have high living costs, do not show the same pattern as Shetland.

In considering the results of these indicators on people's lives, we have not been able to identify direct impacts on material deprivation, largely because of data limitations. However, there is clear evidence of an association between financial constraint and material deprivation. Looking at the Scottish population as a whole, we can note the following relationships, as set out in Table 7:

- Nearly four in ten households facing financial constraint are only in fair or poor health, compared to two in ten who are managing financially.

- The majority facing financial constraint are materially deprived, compared to only 6% of those who do not face this constraint.
- People with financial constraint are particularly likely to lack internet, especially pensioners
- Those facing financial constraint are four times as likely to be dissatisfied with their home.

These results make it clear that financial constraint is a strong signaller of many other negative social and economic outcomes. We can infer that in the case of Shetland, where people have been shown to experience greater financial constraint than other Scots on similar incomes, they will also be more likely to experience various forms of material deprivation.

Table 7   **Relationship between financial constraint and other negative outcomes**

| | Financial Stress category | | |
| | | Getting by/not managing ('financially constrained') | Difference statistically significant? (*) |
Percent reporting fair/poor general health	Managing well/very well		
Total	22.2%	38.8%	*
Working age couple	15.4%	32.2%	*
Pension age couple	33.8%	49.8%	*
Couple with children	8.3%	19.5%	*
Lone parent	15.7%	32.3%	*
Working age single	18.8%	47.6%	*
Pension age single	41.9%	58.2%	*
Percent reporting material deprivation			
Total	6.4%	55.4%	*
Couple with children	4.0%	43.3%	*
Lone parent	23.2%	76.3%	*
Percent with no internet access at home			
Total	14.9%	21.7%	*
Working age couple	2.9%	9.4%	*
Pension age couple	18.7%	32.0%	*
Couple with children	2.3%	2.7%	
Lone parent	6.2%	10.5%	
Working age single	14.5%	31.5%	*
Pension age single	54.7%	67.6%	*
Percent not satisfied with home			
Total	1.9%	7.8%	*
Working age couple	1.8%	4.5%	*
Pension age couple	0.5%	1.4%	
Couple with children	3.2%	9.3%	*
Lone parent	4.8%	13.6%	*
Working age single	2.5%	10.6%	*
Pension age single	2.0%	4.0%	*

3 Analysis of area data, from the Scottish Index of Multiple Deprivation

The **Scottish Index of Multiple Deprivation (SIMD)** provides local area data from administrative sources on a range of indicators that can shed light on the relationship between income and various forms of social outcomes. While this source does not have the disadvantage of small sample sizes in areas like the Scottish islands (because it involves full population counts, not sample surveys), it has a significant limitation linked to rurality. This is in part because poverty and disadvantage are far more geographically dispersed in remote and rural areas, so that even within small-scale data zones, pockets of deprivation may not be picked up. In these areas, deprivation tends to be experienced by individuals and households rather than by whole communities. Furthermore, poverty and deprivation are also likely to manifest in different ways in remote areas like the Scottish islands when compared with other regions in Scotland (Perring, 2006). Particular issues might include difficulties with access to employment and services, and the related issue of transport accessibility and costs, as well as the generally higher living costs, as outlined above.

The Scottish Government recommends that when focussing on remote and rural areas, it can be useful to look at specific domains of the SIMD, rather than the overall ranks (Scottish Government, 2011). This has been the approach taken in our analysis, which explored whether and how the relationship between the income domain and the other SIMD domains varies geographically.

3.1 Data and Method

In each of the domains of SIMD, listed in Table 7, the analysis used the actual values (indicator data) rather than rank order, which cannot be used to say how much more deprived one area is from another, since the difference between two ranks can be small or large.

Investigating how the level of income deprivation in different areas of Scotland is associated with other types of deprivation allows us to evaluate whether this relationship follows a different pattern in Shetland, Orkney and the Western Isles. While we cannot show a causal association with higher living costs in these areas, we can estimate the extent to which indicators of non-income deprivation are worse than would be expected given the relatively low level of income deprivation on the islands.

We used regression analysis to model the relationship between income deprivation and deprivation in other domains. We then calculated predicted values for each outcome, given the level of income deprivation in each area. This produced estimates of how non-income deprivation would look in different geographical areas assuming a uniform relationship with income deprivation, which could be compared to the actual pattern of non-income deprivation.

Table 8   Description of SIMD indicators

Domain	Indicator name	Indicator description
Income	Income deprivation	Percentage of people who are income deprived, calculated using mid-year population estimates for relevant age groups as the denominator. Numerator includes: • Number of income Support and Income-based Employment Support Allowance claimants • Number of Job Seekers Allowance and Guaranteed Pension Credit Claimants • Number of Universal Credit claimants with no employment marker. • Number of children in JSA, IS or ESA households • Number of Adults and children dependent on adults in receipt of tax credits.
Employment	Employment deprivation	Percentage of people who are employment deprived, calculated using mid-year population estimates working age population as the denominator. Numerator includes: • Unemployment Claimant Count averaged over 12 months • Working age Incapacity Benefit or Employment Support Allowance recipients • Working age Severe Disablement Allowance recipients
Health	Comparative illness factor	The CIF is a combined count of the total number of people receiving one or more of Disabled Living Allowance (DLA), Attendance Allowance, Incapacity Benefit (not receiving DLA), Employment Support Allowance and Severe Disablement Allowance. The score is a standardised ratio of the observed count to the expected count in each data zone, given the national age-sex distribution of each element.
	Alcohol	Hospital stays related to alcohol use: standardised ratio
	Drug	Hospital stays related to drug use: standardised ratio
	SMR	Standardised mortality ratio
	Depression	Proportion of population being prescribed drugs for anxiety, depression or psychosis
	Low birth weight	Proportion of live singleton births of low birth weight
	Emergency care	Emergency stays in hospital: standardised ratio

Education	Attendance	School pupil attendance (rate)
	Attainment	Attainment of school leavers (score)
	No qualifications	Working age people with no qualifications: standardised ratio
	Not participating	Proportion of people aged 16-19 not participating in education, employment or training
	University	Proportion of 17-21 year olds entering university
Geographical access to Services	Drive	Average drive time to a petrol station/GP surgery/post office/ primary school/secondary school/ retail centre in minutes
	Public transport	Public transport travel time to a GP surgery/post office/retail centre in minutes
	Broadband	Percentage of premises without access to superfast broadband (at least 30Mb/s download speed)
Crime	Crime rate	Recorded crimes of violence, sexual offences, domestic housebreaking, vandalism, drugs offences, and common assault per 10,000 people
Housing	Overcrowding	Percentage of people in households that are overcrowded
	Central heating	Percentage of people in households without central heating

3.2   Results from SIMD analysis

For most of the indicators in the SIMD, outcomes in Shetland, Orkney and Eileanan Siar were not far from where they would be predicted to be given the income profile of the islands. There were however a number of exceptions. Some are unsurprising and not specifically linked to deprivation – such as the much higher than average driving time to the nearest amenities. However, on several indicators there are signs that disadvantage is higher than would be expected on Shetland, and in some cases in Orkney and Eileanan Siar, and these are listed below. While this is a selective list of those indicators with this type of result, in the case of Shetland there were not any indicators identified where the reverse is true – where outcomes are significantly more favourable than predicted.

a)   Mortality rates

Figure 14 compares standardised mortality ratios (SMRs), which can be used as an approximate indicator of life expectancy. The SMR in each area compares death rates to what would be expected from its demographic profile, indexed to an average of 100 for Scotland as a whole. Because of its favourable income profile, Scotland's predicted mortality rate should be the lowest in Scotland, but in fact it is the 20th out of 32 local authorities (this suggests that life expectancy is 13th highest, rather than the highest as predicted based on income). Of the indicators highlighted in this section, this result is the most important. Mortality rates and life expectancy are the result of a range of different influences, many linked to levels of deprivation throughout the life course. It is therefore concerning that for someone on a given income in Shetland, mortality is significantly higher than elsewhere in Scotland. These results do not apply to the other island authorities, and in Orkney, life expectancy is slightly higher than would be expected even given its favourable income profile.

b)   Drugs and alcohol

On two other health-related indicators, drug and alcohol-related hospital episodes, Shetland experiences worse outcomes than predicted based on income. For drug-related episodes it is 21st, and for alcohol-related episodes it is 18th out of Scotland's 32 local authorities (Figures 15 and 16). In the case of drugs, this is in stark contrast to Orkney and Eileanan Siar, which have exceptionally low drug related drug-related hospital stays. However, for alcohol, like in Shetland, both other island authorities have much more hospital stays than would be predicted.

c)   Entry to university

The most severe discrepancy between predicted and observed outcomes in Shetland is on an educational indicator – entry to university (Figure 17). Despite having the most favourable income profile in Scotland, Shetland has the 8th lowest rate of university entrance among its young people among the 32 local authorities. This may be affected partly by the remoteness of Shetland from most higher education institutions, but has a significant effect on young adults' prospects. A similar result applies in Orkney, and to a lesser extent to Eileanan Siar.

Figure 14   Standardised mortality ratios
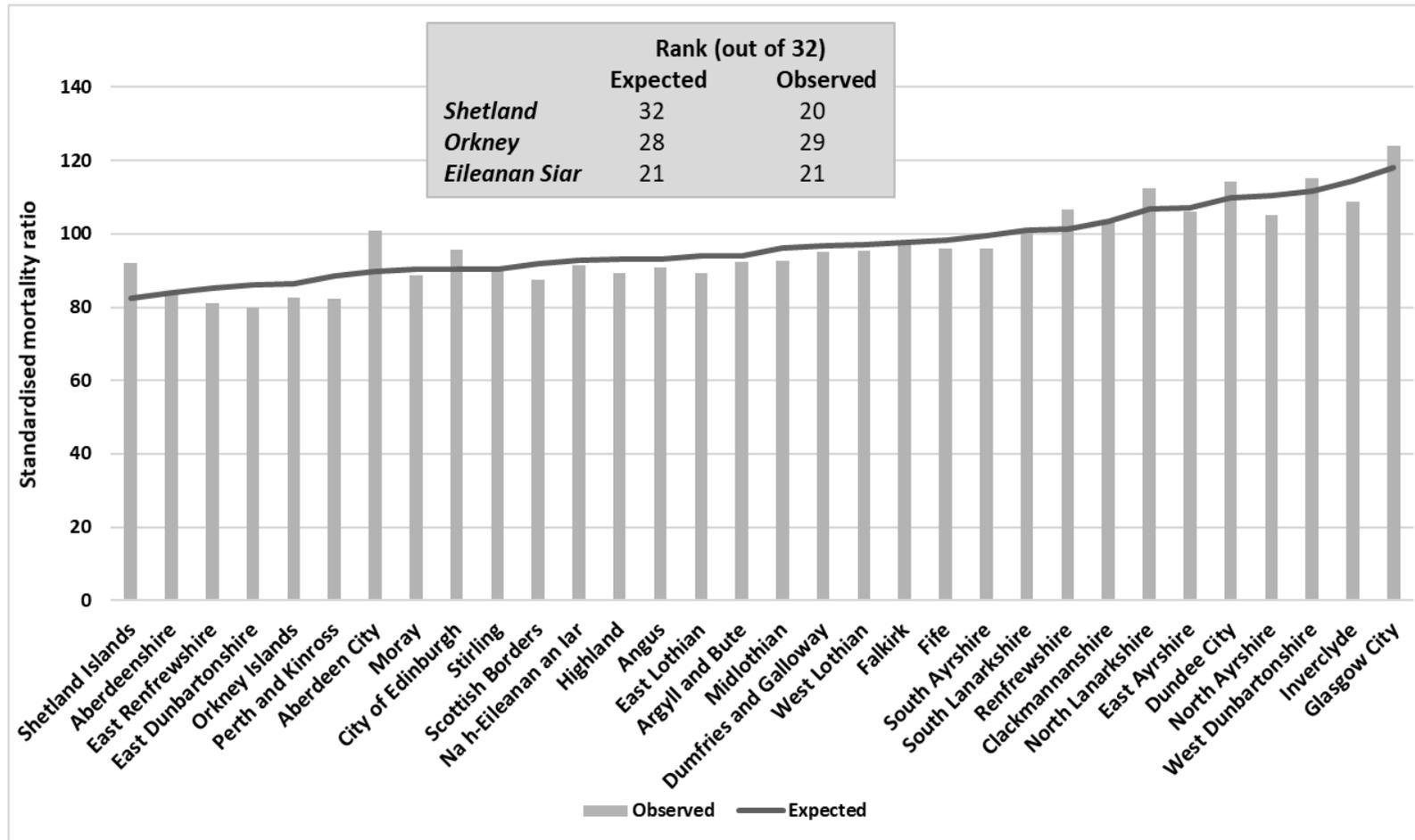
Figure 15   Index of drug related hospital stays

	Rank (out of 32)	
	Expected	Observed
Shetland	32	21
Orkney	28	30
Eileanan Siar	21	32
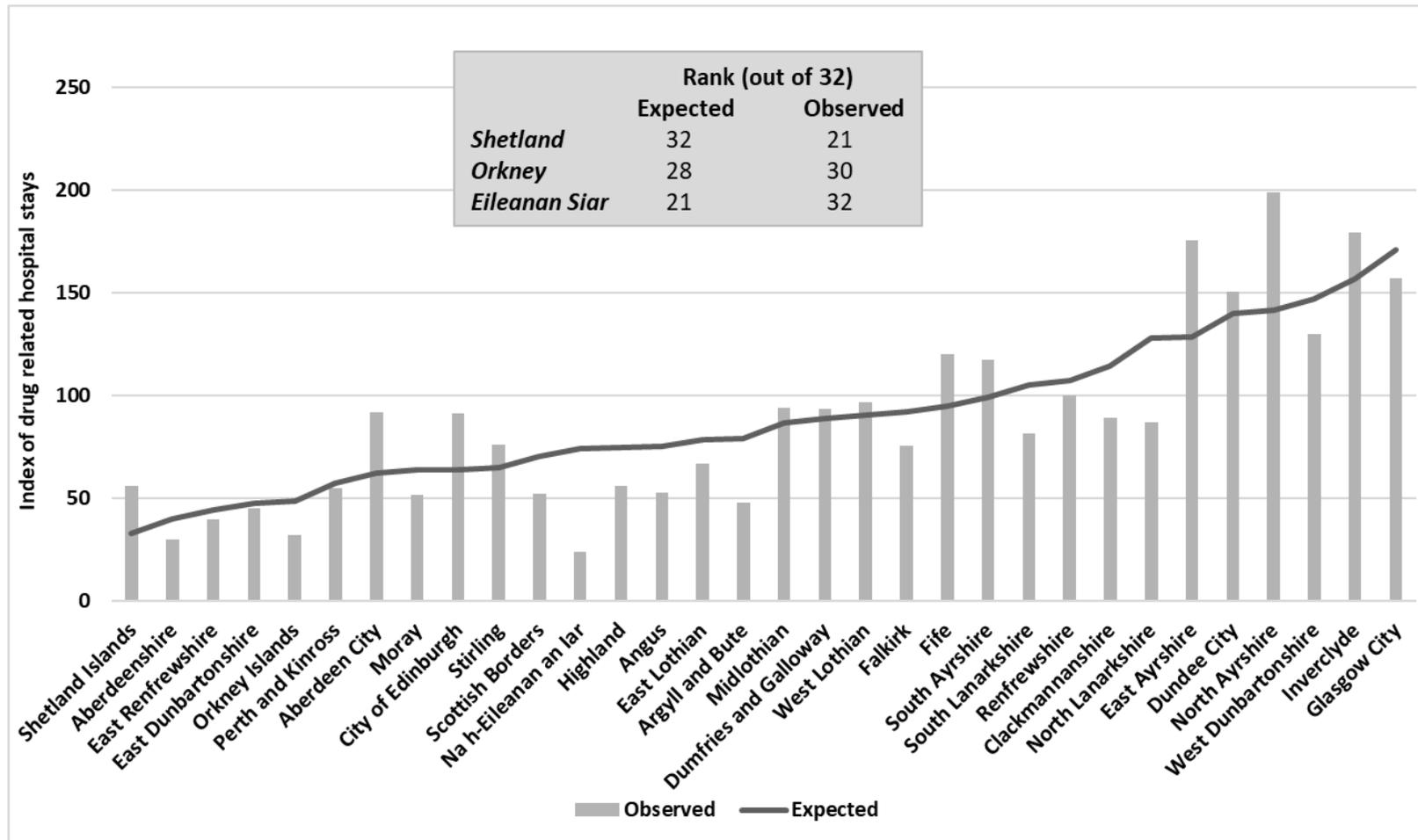
Figure 12   Index of alcohol related hospital stays
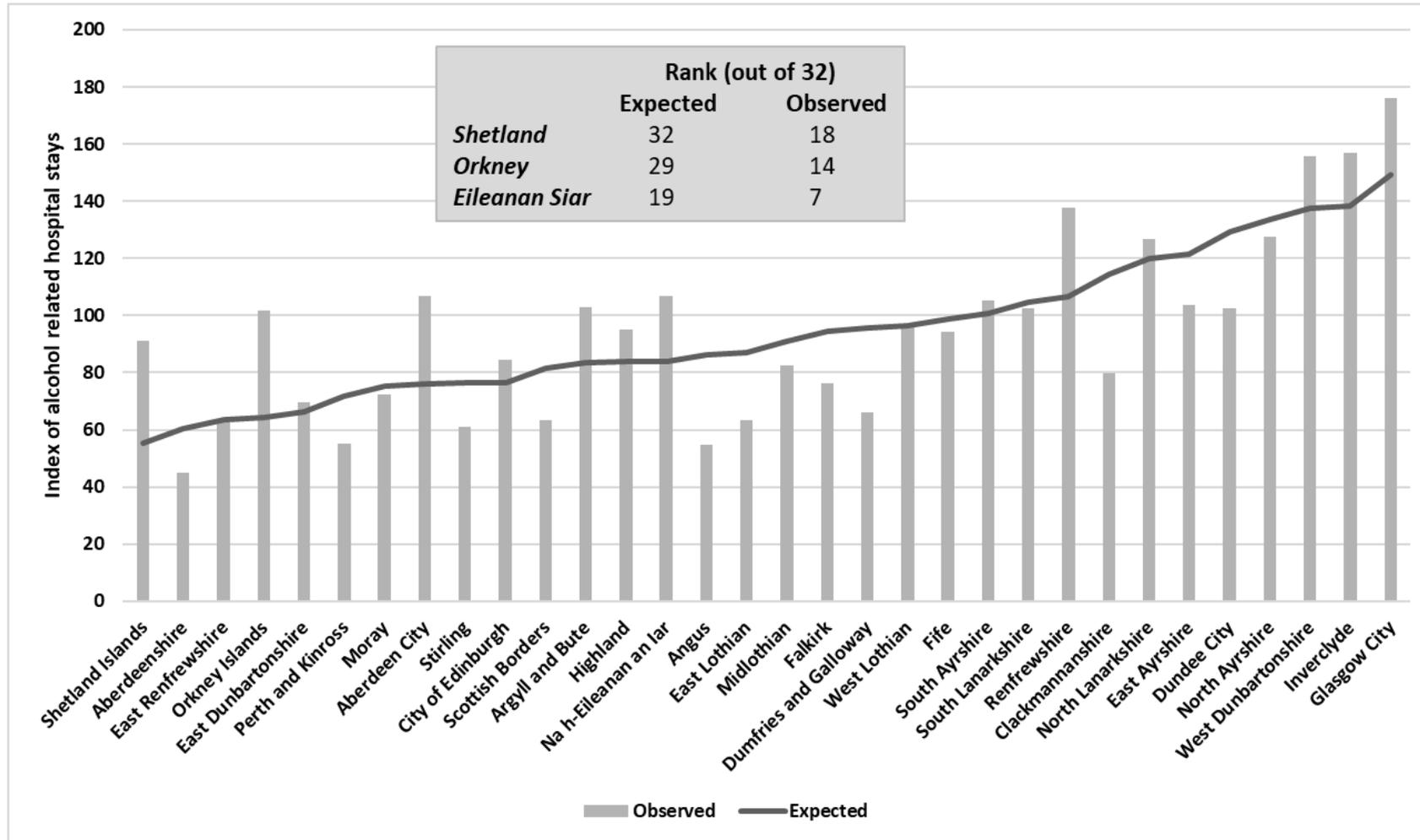
Figure 14   **Proportion of 17-21 year olds entering university**

	Rank (out of 32)	
	Expected	Observed
Shetland	32	8
Orkney	28	10
Eileanan Siar	21	16
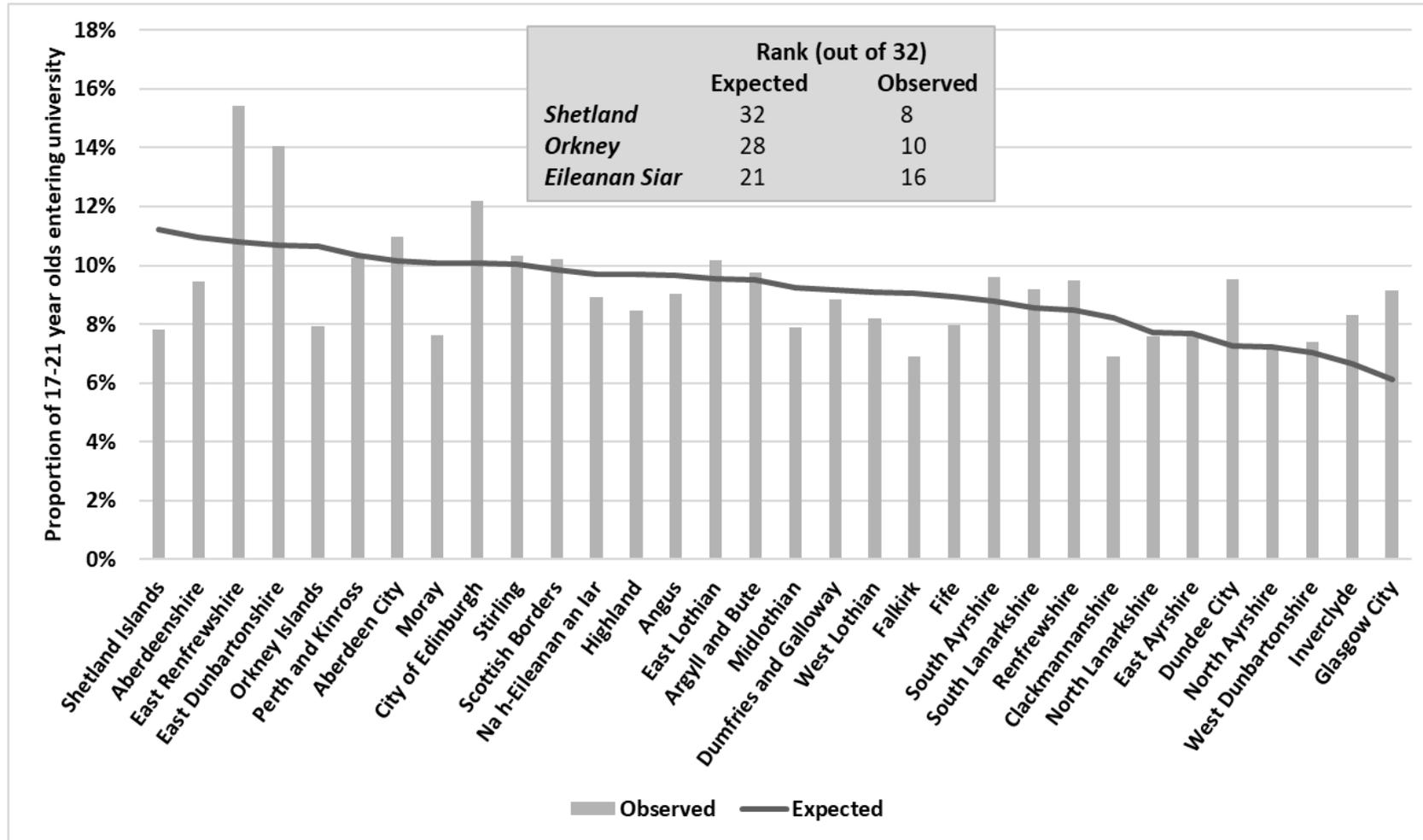
4 Data limitations

The analyses in this report made use of the best available data at the time of writing, to assess the relationship between income, living costs and subsequent outcomes in Scotland's island communities. There are, however, a number of limitations relating to the data, as described below.

With any large-scale survey data, there tends to be a time lag between the collection and release of data, to varying degrees. When the analysis outlined in this report was carried out, the 2017 SHS was the most recent available wave of the survey for which income data could be obtained. It could be argued, therefore, that the SHS analysis may not reflect the current situation in the areas of interest. However, the analysis based on the APS was much more up to date, being based on data for the year ending March 2020. The fact that this analysis showed similar associations to the SHS results, albeit for different outcome variables, lends support to the ongoing relevance of the results from the Scottish survey.

At a geographical level, the survey data were also only able to provide indications of associations for council areas. We can assume that there will be significant variation in the observed relationships within these areas, with some towns, villages, and neighbourhoods being more strongly affected than others. While data at smaller levels of geography are theoretically available (for example, the SHS can be analysed right down to postcode level), in practice for the type of analysis included in this report the sample sizes at these smaller levels of geography would not have been large enough to produce any meaningful results. Similarly, the analysis using SIMD did not account for the fact that people who are disadvantaged as individuals can live in areas that are not particularly deprived in terms of SIMD, and vice versa. Investigating these within-area differences was beyond the aims and scope of the present report. However, it is hoped that the findings will provide a useful starting point for any future analysis that seeks to explore these finer-grained geographical differences, perhaps with the aim of targeting interventions within specific local areas.

We also investigated the use of more ad-hoc data that could be accessed via local organisations, for example. This included data from Citizens Advice and from local education authorities. One of the constraints associated with these data was that they were in some cases available for the Island regions only. Given that the analysis was based on comparison with the rest of Scotland, the data were therefore of limited use for the core work. Data that we could have potentially accessed for all of Scotland were in other cases quite selective (eg. the Citizens Advice data were only collected from those who sought help). Other Scotland-wide data, such as information on school attendance, already included analysis of links to deprivation as measured using SIMD. It was therefore unlikely that these data would have provided any additional value over the administrative data that we ultimately included to measure local context (job density, claimant count, and average house prices), in addition to our own analysis of SIMD.

5 Conclusion

The findings in this analysis confirm that people are facing hardship in Shetland in what on the surface seem relatively more favourable conditions than elsewhere in Scotland. In certain selected respects, these findings are repeated in Orkney and Eileanan Siar, but the finding of greater disadvantage than predicted by income and unemployment rates is far more clear-cut and generalised in Shetland. The fact that this result is observed on three different measures from different sources – financial well-being from the SHS, psychological wellbeing from the APS and outcomes such as mortality rates from the SIMD – provides powerful corroboration of the overall pattern.

The most clearcut of these results come from the relatively high levels of financial constraint experienced by Shetlanders. Adjusting for socioeconomic characteristics of individuals and small areas, they are the fourth most likely out of any Scottish local authority population to report that they are not managing well financially. Part of this can be attributed to high living costs: if incomes in Shetland are adjusted to the higher cost of living identified in MIS, the results are closer to the Scotland average.

The fact that people with given characteristics at an individual and local area level are thus much more likely than average to face financial difficulties in Shetland has important implications for wider social indicators. Those reporting such financial difficulties are far more likely to experience material deprivation and to be in poor health.

Furthermore, the other survey evidence presented here shows that Shetlanders are also more likely to be less satisfied with life and express anxiety than would be predicted in a local authority with such low unemployment rates, while local area data show that life expectancy, university participation and drug and alcohol problems are worse than would be expected in Shetland given its income profile.

These results do not demonstrate a straightforward relationship between income adjusted for the additional cost of living in Shetland identified in MIS and the various social outcomes associated with income. Clearly, the fact that the in Orkney and the Western Isles, which also have high costs, outcomes are far more mixed and in some cases better than predicted from socio-economic indicators, suggests that higher costs may contribute to but do not determine the Shetland outcomes. Moreover, for some social indicators, the relationship with income is much as expected in Shetland without the MIS adjustment. Yet for those identified here, it is clear that a conventional income profile of Shetland can lead to an underestimation of the severity of the social challenges that it faces. The fact that a pound earned in Shetland does not go as far as a pound earned elsewhere in Scotland in providing for the minimum necessities of life is likely to play a large part in contributing to this difference.

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7 Appendices

List of tables

Table A 1   **Odds ratios and 95% confidence intervals for nested logistic regression models predicting financial constraint**

	Model 1: unadjusted		Model 2: adjusted for household characteristics		Model 3: adjusted for contextual factors		Model 4: adjusted for MIS	
	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI
Council area (ref. City of Edinburgh)								
Aberdeen City	0.993	[0.840,1.174]	0.981	[0.812,1.184]	0.971	[0.616,1.531]	0.989	[0.627,1.563]
Aberdeenshire	1.039	[0.880,1.227]	1.227*	[1.021,1.475]	0.86	[0.357,2.068]	0.876	[0.364,2.110]
Angus	1.375***	[1.158,1.634]	1.355**	[1.123,1.636]	0.788	[0.265,2.349]	0.83	[0.278,2.476]
Argyll and Bute	0.984	[0.818,1.185]	0.939	[0.762,1.157]	0.622	[0.239,1.622]	0.664	[0.254,1.734]
Clackmannanshire	1.312**	[1.100,1.566]	1.149	[0.947,1.394]	0.539	[0.145,1.995]	0.564	[0.152,2.091]
Dumfries and Galloway	1.454***	[1.216,1.739]	1.398**	[1.144,1.708]	0.84	[0.283,2.495]	0.89	[0.299,2.648]
Dundee City	2.187***	[1.827,2.618]	1.720***	[1.408,2.102]	0.98	[0.399,2.405]	1.046	[0.426,2.571]
East Ayrshire	1.527***	[1.272,1.833]	1.359**	[1.110,1.664]	0.619	[0.168,2.277]	0.653	[0.177,2.403]
East Dunbartonshire	0.791*	[0.649,0.964]	1.023	[0.823,1.271]	0.64	[0.213,1.923]	0.645	[0.214,1.943]
East Lothian	1.185+	[0.992,1.415]	1.192+	[0.978,1.451]	0.745	[0.284,1.949]	0.754	[0.288,1.975]
East Renfrewshire	0.949	[0.786,1.146]	1.203+	[0.980,1.476]	0.745	[0.236,2.353]	0.75	[0.237,2.373]
Falkirk	1.335**	[1.119,1.594]	1.196+	[0.984,1.453]	0.659	[0.216,2.014]	0.691	[0.226,2.114]
Fife	1.076	[0.933,1.241]	0.953	[0.813,1.117]	0.517	[0.173,1.543]	0.542	[0.181,1.619]
Glasgow City	1.827***	[1.614,2.068]	1.394***	[1.215,1.601]	0.91	[0.411,2.015]	0.95	[0.428,2.109]
Highland	1.314***	[1.118,1.544]	1.374***	[1.150,1.641]	0.933	[0.377,2.309]	0.983	[0.397,2.436]
Inverclyde	1.619***	[1.351,1.941]	1.343**	[1.095,1.647]	0.663	[0.209,2.100]	0.695	[0.219,2.203]
Midlothian	1.249*	[1.035,1.506]	1.173	[0.956,1.440]	0.721	[0.272,1.913]	0.729	[0.274,1.935]
Moray	1.308**	[1.100,1.556]	1.333**	[1.098,1.618]	0.822	[0.289,2.341]	0.875	[0.307,2.494]
Na h-Eileanan Siar	1.122	[0.943,1.334]	1.03	[0.846,1.255]	0.564	[0.161,1.975]	0.509	[0.145,1.788]
North Ayrshire	1.830***	[1.528,2.191]	1.680***	[1.373,2.056]	0.723	[0.200,2.616]	0.766	[0.212,2.773]
North Lanarkshire	1.469***	[1.265,1.705]	1.323***	[1.123,1.558]	0.662	[0.200,2.197]	0.7	[0.211,2.325]
Orkney Islands	0.799*	[0.666,0.958]	0.748**	[0.613,0.914]	0.533	[0.181,1.566]	0.45	[0.153,1.327]
Perth and Kinross	1.455***	[1.224,1.731]	1.623***	[1.341,1.964]	1.143	[0.487,2.680]	1.194	[0.509,2.804]
Renfrewshire	1.225*	[1.028,1.461]	1.079	[0.892,1.306]	0.617	[0.227,1.678]	0.643	[0.236,1.752]
Scottish Borders	1.16	[0.968,1.390]	1.061	[0.866,1.300]	0.668	[0.253,1.767]	0.69	[0.261,1.827]
Shetland Islands	1.149	[0.965,1.367]	1.269*	[1.047,1.539]	0.978	[0.348,2.753]	0.815	[0.288,2.304]

Continued…

Table A 1 Odds ratios and 95% confidence intervals for nested logistic regression models predicting financial constraint (continued)

	Model 1: unadjusted		Model 2: adjusted for household characteristics		Model 3: adjusted for contextual factors		Model 4: adjusted for MIS	
	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI
South Ayrshire	1.204*	[1.010,1.436]	1.261*	[1.040,1.530]	0.737	[0.273,1.990]	0.773	[0.286,2.091]
South Lanarkshire	1.578***	[1.356,1.835]	1.702***	[1.440,2.013]	0.926	[0.301,2.848]	0.968	[0.314,2.979]
Stirling	0.89	[0.739,1.072]	0.846	[0.690,1.036]	0.576	[0.239,1.390]	0.594	[0.246,1.434]
West Dunbartonshire	1.549***	[1.287,1.864]	1.154	[0.942,1.414]	0.534	[0.161,1.769]	0.571	[0.172,1.892]
West Lothian	1.282**	[1.065,1.544]	1.215+	[0.991,1.489]	0.723	[0.256,2.040]	0.751	[0.266,2.119]
Year (ref 2014)								
2015			0.916*	[0.844,0.994]	0.993	[0.880,1.120]	0.976	[0.865,1.101]
2016			0.893**	[0.822,0.969]	0.988	[0.864,1.131]	0.961	[0.840,1.100]
2017			0.935	[0.861,1.015]	1.022	[0.902,1.157]	0.973	[0.858,1.102]
Net household income			0.999***	[0.999,1.000]	0.999***	[0.999,1.000]	1.000**	[1.000,1.000]
Household type (ref working age couple)								
Pension age couple			0.577***	[0.513,0.649]	0.577***	[0.513,0.649]	0.655***	[0.580,0.739]
Couple with children			1.597***	[1.453,1.755]	1.597***	[1.453,1.755]	1.284***	[1.151,1.432]
Lone parent			2.758***	[2.371,3.209]	2.757***	[2.371,3.207]	2.027***	[1.715,2.396]
Working age single			1.913***	[1.742,2.100]	1.911***	[1.740,2.098]	1.777***	[1.615,1.955]
Pension age single			0.787***	[0.703,0.882]	0.787***	[0.703,0.882]	0.799***	[0.713,0.896]
Household work status (ref working)								
Partially working			0.98	[0.882,1.088]	0.981	[0.883,1.090]	1.105+	[0.991,1.232]
Non-working			0.907*	[0.826,0.997]	0.907*	[0.825,0.997]	0.968	[0.878,1.067]
Housing tenure (ref. owner occupied)								
Private rent			2.011***	[1.840,2.198]	2.012***	[1.841,2.199]	1.769***	[1.609,1.945]
Social housing			2.808***	[2.591,3.043]	2.811***	[2.594,3.047]	2.543***	[2.337,2.767]
Job density					0.594	[0.118,2.988]	0.581	[0.115,2.931]
Claimant count					1.08	[0.963,1.213]	1.071	[0.954,1.202]
House prices								
Net income after MIS							0.999***	[0.998,0.999]
Above/below MIS (ref. above)								
Below MIS							1.175***	[1.068,1.292]
Constant	0.559***	[0.511,0.612]	1.373***	[1.154,1.633]	3.503	[0.321,38.234]	1.79	[0.163,19.653]

*+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001*

Table A 2 **Odds ratios and 95% confidence intervals for nested logistic regression models predicting financial constraint in three island groups compared with the rest of Scotland, stratified by household type**

	Model 1: unadjusted		Model 2: adjusted for household characteristics		Model 3: adjusted for contextual factors		Model 4: adjusted for MIS	
	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI	OR (financial constraint)	95% CI
Working age couple								
Shetland Islands	1.1	[0.79,1.53]	1.12	[0.79,1.60]	1.17	[0.76,1.79]	0.74	[0.47,1.15]
Orkney Islands	0.75	[0.53,1.06]	0.70+	[0.48,1.02]	0.7	[0.46,1.08]	0.43***	[0.27,0.68]
Na h-Eileanan Siar	0.75	[0.50,1.12]	0.73	[0.48,1.11]	0.63*	[0.40,0.97]	0.46***	[0.29,0.72]
Pension age couple								
Shetland Islands	0.85	[0.55,1.32]	0.88	[0.55,1.39]	0.71	[0.41,1.22]	0.56*	[0.32,0.99]
Orkney Islands	0.60*	[0.39,0.94]	0.55*	[0.35,0.87]	0.46**	[0.28,0.77]	0.36***	[0.21,0.62]
Na h-Eileanan Siar	1.25	[0.86,1.84]	1.24	[0.85,1.82]	1.07	[0.71,1.60]	0.86	[0.55,1.35]
Couple with children								
Shetland Islands	0.69*	[0.50,0.95]	0.71*	[0.50,0.99]	0.94	[0.62,1.43]	0.76	[0.48,1.19]
Orkney Islands	0.62*	[0.42,0.92]	0.50**	[0.33,0.78]	0.64+	[0.39,1.03]	0.54*	[0.33,0.89]
Na h-Eileanan Siar	0.88	[0.61,1.28]	0.77	[0.51,1.16]	0.82	[0.53,1.27]	0.74	[0.48,1.16]
Lone parent								
Shetland Islands	0.59	[0.29,1.21]	0.59	[0.30,1.18]	0.89	[0.37,2.14]	0.9	[0.37,2.16]
Orkney Islands	0.48+	[0.20,1.11]	0.6	[0.24,1.47]	0.87	[0.32,2.42]	0.91	[0.33,2.55]
Na h-Eileanan Siar	0.32**	[0.15,0.68]	0.27**	[0.13,0.59]	0.30**	[0.13,0.67]	0.29**	[0.13,0.66]
Working age single								
Shetland Islands	0.89	[0.64,1.23]	1.27	[0.88,1.84]	1.4	[0.90,2.18]	1.01	[0.64,1.60]
Orkney Islands	0.69*	[0.50,0.96]	0.65*	[0.46,0.92]	0.67+	[0.45,1.00]	0.48***	[0.31,0.75]
Na h-Eileanan Siar	0.74*	[0.55,0.99]	0.67*	[0.48,0.93]	0.62**	[0.44,0.88]	0.49***	[0.34,0.71]
Pension age single								
Shetland Islands	1.22	[0.83,1.80]	1.25	[0.83,1.91]	1.07	[0.66,1.72]	1.01	[0.61,1.67]
Orkney Islands	0.60**	[0.41,0.87]	0.57**	[0.38,0.85]	0.48**	[0.31,0.75]	0.43***	[0.27,0.71]
Na h-Eileanan Siar	1.17	[0.84,1.62]	1.16	[0.82,1.65]	1.01	[0.70,1.46]	0.94	[0.62,1.44]

*+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001*

Table A 3   Odds ratios and 95% confidence intervals for nested logistic regression models predicting material deprivation

	Model 1: unadjusted		Model 2: adjusted for household characteristics		Model 3: adjusted for contextual factors		Model 4: adjusted for MIS	
	OR (material deprivation)	95% CI	OR (material deprivation)	95% CI	OR (material deprivation)	95% CI	OR (material deprivation)	95% CI
Area (ref Edinburgh)								
Glasgow	3.47***	[2.12,5.66]	2.19*	[1.18,4.09]	0.88	[0.27,2.86]	0.81	[0.23,2.84]
Fife	1.89*	[1.09,3.26]	1.65	[0.80,3.41]	0.93	[0.24,3.64]	0.68	[0.16,2.90]
North Lanarkshire	2.12**	[1.22,3.71]	2.41*	[1.19,4.88]	1.17	[0.27,5.10]	0.87	[0.18,4.18]
South Lanarkshire	2.20*	[1.20,4.05]	2.37*	[1.09,5.15]	1.37	[0.33,5.66]	0.85	[0.19,3.87]
Highlands	1.55	[0.89,2.69]	1.58	[0.79,3.15]	0.84	[0.20,3.45]	0.84	[0.19,3.71]
Grampian	1.23	[0.69,2.19]	1.86+	[0.94,3.69]	1.33	[0.52,3.43]	1.59	[0.59,4.27]
Tayside	2.37***	[1.42,3.96]	2.37**	[1.29,4.34]	1.38	[0.42,4.52]	1.2	[0.34,4.19]
Central	1.6	[0.91,2.81]	1.34	[0.68,2.63]	0.74	[0.19,2.92]	0.63	[0.15,2.69]
Dunbartonshire	1.35	[0.75,2.43]	1.44	[0.70,2.93]	1.01	[0.29,3.53]	1.06	[0.27,4.11]
Renfrewshire and Inverclyde	1.5	[0.86,2.59]	1.51	[0.79,2.88]	0.88	[0.24,3.22]	0.75	[0.19,2.92]
Ayrshire	2.48***	[1.45,4.24]	1.93*	[1.04,3.61]	0.91	[0.22,3.71]	0.67	[0.15,2.95]
Lothian	1.75*	[1.03,2.99]	1.86+	[0.93,3.72]	1.34	[0.42,4.23]	1.3	[0.38,4.43]
Southern Scotland	1.99*	[1.10,3.61]	1.25	[0.60,2.61]	0.67	[0.16,2.84]	0.59	[0.13,2.70]
Islands	1.29	[0.74,2.22]	1.29	[0.66,2.54]	0.57	[0.10,3.08]	0.56	[0.09,3.44]
Year (ref 2014)								
2015			0.82	[0.58,1.16]	0.93	[0.64,1.36]	1.01	[0.68,1.52]
2016			0.73+	[0.52,1.02]	0.82	[0.57,1.18]	0.84	[0.57,1.24]
2017			0.79	[0.55,1.13]	0.88	[0.60,1.29]	0.9	[0.58,1.40]
Net household income			1.00***	[1.00,1.00]	1.00***	[1.00,1.00]	1.00***	[1.00,1.00]
Household type (ref couple with children)								
Lone parent			2.22***	[1.62,3.05]	2.20***	[1.60,3.02]	2.30***	[1.58,3.35]
Household work status (ref working)								
Partially working			1.19	[0.85,1.66]	1.18	[0.84,1.66]	1.17	[0.76,1.79]
Non-working			2.51***	[1.62,3.88]	2.51***	[1.62,3.88]	2.35**	[1.37,4.01]
Housing tenure (ref. owner occupied)								
Private rent			2.62***	[1.88,3.67]	2.62***	[1.87,3.67]	2.61***	[1.80,3.79]
Social housing			5.54***	[4.03,7.60]	5.56***	[4.05,7.63]	5.41***	[3.83,7.64]
Job density					2.58	[0.68,9.87]	2.4	[0.59,9.77]
Claimant count					1.11	[0.88,1.40]	1.17	[0.91,1.50]
House prices								
Above/below MIS (ref. above)								
Below MIS							1.92**	[1.17,3.15]
Constant	0.25***	[0.17,0.38]	0.66	[0.32,1.33]	0.78	[0.05,11.39]	0.67	[0.04,12.34]

*+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001*

Table A 4   **Beta coefficients and 95% confidence intervals for association between SIMD income rate and other domains of SIMD**

	Standardised mortality ratio		Index of drug related hospital stays		Index of alcohol related hospital stays		Entry to university	
	beta coefficient	95% CI	beta coefficient	95% CI	beta coefficient	95% CI	beta coefficient	95% CI
SIMD Income rate	252.74***	[242.09,263.40]	979.51***	[929.10,1029.91]	685.53***	[655.60,715.45]	-0.36***	[-0.37,-0.35]
Constant	67.92***	[66.33,69.51]	-22.71***	[-27.27,-18.14]	17.04***	[14.01,20.06]	0.13***	[0.13,0.14]
R^2	0.30		0.47		0.47		0.29	

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001