Dietary patterns of households in Scotland: differences by level of deprivation and associations with dietary goals.

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Authors' contributions

SW conceived and led the study, conducted the analysis and interpretation of data and wrote the paper. All authors made substantial contributions to the interpretation of the data, and contributed to the writing of the paper. All authors gave final approval of the version of the paper.

Abstract

Background: Foods tend to be consumed in combinations, and dietary pattern analysis and diet quality scores are often more appropriate methods of assessing overall diet quality than is intakes of individual foods or nutrients.

Aim: To evaluate dietary patterns from food and drink purchases of households in Scotland, and to identify any dietary patterns that were associated with closer adherence to the Revised Dietary Goals for Scotland (RDGS).

Methods: A cross-sectional study of estimated food and drink intakes using Kantar Worldpanel household purchase data in Scotland collected during 2012. The amounts of food and drink purchased were converted to estimated amounts available for consumption per person by adjusting for household waste, household size and composition (n=720). Dietary patterns were identified using Principal Components Analysis. A Diet Quality Index (DQI), based on the RDGS, was calculated.

Results: Mean DQI score was low at 38 out of a possible maximum of 100 indicating that, on average, few of the dietary goals were being met. Six dietary patterns were identified, which explained 35% of the total variance in estimated food and drink intake. Three dietary patterns showed statistically significant associations with lower DQI scores (less healthy diets), and one with significantly higher DQI scores (healthier diets).

Conclusion: Investigating dietary patterns to show which foods tend to be purchased together may assist in targeting dietary habits by focussing on key food groups, and in gaining the greatest improvement in diet quality from the most achievable change in diet.

Keywords: Food purchasing, dietary patterns, diet quality index, dietary goals, social deprivation.

Introduction

Food choice in Scotland contributes to it having one of the worst obesity records among developed countries (The Scottish Government, 2010). On average, people in Scotland consume a diet in which total fat, saturated fat and sugar contribute more to energy intake than is recommended (Food Standards Scotland, 2015). Salt intakes are also higher, and intakes of fruits, vegetables and oil rich fish are lower than recommended amounts (Food Standards Scotland, 2015).The Revised Dietary Goals for Scotland (RDGS) are used to monitor changes in dietary intakes and aid policy development for reducing the burden of diet-related disease in Scotland (The Scottish Government, 2016). The RDGS are similar to those of other countries with goals for; dietary energy density, lowering energy intake, minimum intakes for fruits and vegetables, fibre, oil rich fish and total carbohydrate, and upper limits for red and processed meat, salt, and percentage energy intake from fat, saturated fat, trans fat, and free-sugars (The Scottish Government, 2016).

Increasing the consumption of some foods will contribute to more than one of the RDGS. Fruits and vegetables will contribute to increasing fibre intakes in addition to contributing towards meeting the fruits and vegetables goal, for example. Higher than recommended intakes of processed meat products will contribute towards exceeding the total of red and processed meat target, but may also increase salt, and percentage energy from fat and saturated fat, and indirectly to lowering percentage energy from total carbohydrate and free sugars. Other foods contain nutrients that should be increased as well as those that should be decreased from current average levels, such as breakfast cereals that may contain useful amounts of fibre, but also may contain relatively high amounts of salt and free sugars. Furthermore, dietary pattern analysis shows that the foods people choose tend to be related (e.g. Hu et al., 1999). Therefore, the overall effect of increasing or decreasing intakes of particular foods on diet quality may be different from that predicted.

Diet quality scores are frequently used when investigating the relationship between diet and disease outcomes, because intakes of foods within a diet are correlated, and because many dietary factors contribute to the risk of developing most diseases. Diet quality scores can also summarize how well an individual's diet compares to a collection of dietary goals, whether based on foods, nutrients, or a combination of both (Waijers et al., 2007). For example, adherence to the Dietary Guidelines for Americans can be assessed using the Healthy Eating Index (HEI-2010), which has been evaluated to be a valid and reliable index of diet quality (Guenther et al., 2014). Higher HEI-2010 scores (healthier diets) are associated with decreased risk of mortality in older Americans (Reedy et al., 2014).

Diet scores and indices are calculated as the sum of several (typically around 15) dietary factors, and similar scores can be obtained from quite different diets and combinations of foods. Dietary pattern analysis can identify the combinations of foods that are selected by individuals that relate to higher diet quality scores. One statistical method for considering the overall diet is principal components analysis (PCA), which reduces a large number of variables (such as all the foods reported during a dietary survey) to a smaller number that still reflects a large proportion of the information contained in the original data.

To evaluate dietary patterns from food and drink purchases of households in Scotland, and to identify any dietary patterns that were associated with closer adherence to the Revised Dietary Goals for Scotland. In addition, differences in dietary patterns of food and drink purchasing across households of different levels of social deprivation were assessed.

Methods

Data

Analyses were conducted on continuous household consumer purchase data collected routinely by Kantar WorldPanel (KWP) from 2844 households in Scotland during 2012. These data are for all food and drink purchased and brought into the home; items that are not brought into the home (e.g. restaurant meals) are not included. Household food and drink purchase data were adjusted to estimated values of foods and nutrients per person as published previously (Whybrow et al., 2017). Briefly, this was achieved using the following steps.

Weights "as purchased" were adjusted to weight of foods and drinks that were estimated to have been eaten ("as consumed") using estimated factors for unavoidable and avoidable waste.

Composite foods (such as ready-made lasagne) were disaggregated to provide an estimate of the amounts of RDGS relevant foods (e.g. fruits, vegetables, meat and oil rich fish).

Nutritional information (i.e. energy, protein, total fat, saturated fat, carbohydrate, sugars, fibre and sodium) was collected by KWP mainly from product labels and food composition tables, or imputed from product group averages.

Energy density (kcal/100g) of the food purchased was calculated from the contribution of all food and milks, but excluded all drinks (tea, coffee, water, fruit juices, squashes, sugar-containing drinks, and artificially-sweetened drinks). This is the same methods as used in setting the RDGS (The Scottish Government, 2016).

Non Milk Extrinsic Sugar values, which were considered similar to added sugar values, were estimated using methods described by Kelly *et al.* (2005).

Salt was calculated as 2.5 times the sodium content of foods. Purchases of table salt were not included as not all table salt was for consumption, with exceptionally high purchases in the winter (salt is often used to de-ice paths).

Equalized household values were calculated to give estimates comparable to the RDGSs. A reference energy requirement for all adults was estimated as the average for 19-59 year old males and females (9.3MJ per day) (Scientific Advisory Committee on Nutrition, 2011). The contribution of children under 2 years old was not included in the estimation of household energy requirements. For all other children and adolescents (2 – 18 years old), a *pro rata* adult equivalent estimated energy requirement was calculated. The total estimated energy requirement for each household was calculated by summing the values for adults and adult equivalent requirements for children. Household values for food purchases were then divided by the total number of adult equivalents to provide a per person estimation.

Recommended fibre intakes (as measured using AOAC methodology) are 15g/day for children aged 2 to 5 years, 20g/day (5 to 11 years), 25g/day (11 to 16 years) and 30g/day for adults (16+ years). Estimated fibre intake was expressed as a percentage of the calculated total household fibre requirement.

Households reporting food purchases that gave amounts of energy "as purchased" that were less than 90% of estimated energy requirements were excluded from these analyses. This assumes that 10% of energy intake comes from food and drinks that are consumed outside the home, and therefore not captured by KWP in the data used in this study.

Calculation of Diet Quality Index

A Diet Quality Index (DQI) was calculated, based on the RDGSs, and adapted from the earlier Scottish Dietary Targets related Diet Quality index (Armstrong et al., 2009). The score for each component was calculated as described in table 1. The total DQI score was the sum of the individual components.

< table 1>

Food and beverage purchasing patterns

Food purchase data were aggregated into 38 food groups (table 2).

< table 2 >

Area based index of deprivation level.

Socio-economic disadvantage was measured through the Scottish Index of Multiple Deprivation (SIMD), which is based on ranking (with 1 as the most deprived) of geographic areas by a single value calculated from seven domains; current income, employment, health, education skills and training, geographic access to services, housing and crime (Scottish Executive, 2006). Each household's SIMD value was obtained by Kantar Worldpanel through data linkage to the Scottish Neighbourhood Statistics database (The Scottish Government, 2004) using postcodes.

Statistical analysis

Dietary patterns were extracted using principal components analysis using the weight (g/equivalized person/day) of the 38 food groups for each household. An eigenvalue of >1.40 was used as the criterion for determining the number of principal components to retain, which was selected by examining the scree plot. Varimax rotation was conducted to minimize the complexity of the components. Food groups (residuals) with factor score coefficients >0.3 or <-0.3 were used to define the dietary patterns. For each household the factor loading score for each dietary pattern was calculated; the higher the factor loading score, the closer the household was associated with the dietary pattern. Households were divided into quintiles of each dietary pattern score. Univariate models were calculated for each of the dietary pattern scores against DQI score.

Analyses were conducted using SPSS Version 24 (SPSS/IBM Corp, Armonk, New York, NY).

Results

After excluding households reporting food and drink purchases that equated to energy intakes 10% less than estimated requirements, 720 households remained in the dataset for analysis. Mean DQI score was 38 (S.D. ± 13.3).

< table 3>

Six dietary patterns were identified (table 3) by the principal components analysis from the 38 food groups, explaining 35% of the total variance in food intake. The greater the factor loading for a food group, the more that food group explained of the variance in the factor analysis.

Factor 1 was characterized by higher purchases of convenience foods (ready meals, chips and pulses, of which canned baked beans was the largest contributor), meat, white bread, savoury snacks, table sauces, pasta, cheese, potatoes, diet soft drinks and low-fibre breakfast cereals. This factor explained 8.9% of the total variance.

Higher amounts purchased of fruits and vegetables, pasta, rice, table sauces and fish (oil-rich and white) characterized factor 2. Lower amounts purchased of sugar snacks, biscuits and cake also characterized this factor. Factor 2 explained 6.4% of the total variance.

Factor 3 was characterized by lower amounts purchased of cooking oils and fats, red meat, high-fat spread, eggs and potatoes. The factor was also characterized by higher amounts purchased of high-fibre breakfast cereals, full-fat dairy and desserts. This factor explained 5.8% of the variance.

Higher amounts purchased of flour, sugar, high-fat spreads, jam, full-fat dairy and biscuits were characteristics of factor 4, along with lower amounts purchased of alcoholic drinks and white heat. Factor 4 explained 5.4% of the total variance.

Only four food groups characterised factor 5, which explained 4.7% of the total variance, with higher amounts purchased of nuts, savoury snacks and chips, and lower amounts purchased of lower-fat dairy products.

Higher amounts purchased of reduced-fat spreads, table sauces, pulses, cooking oils and fats, and lower amounts purchased of low-fibre breakfast cereals characterized factor 6. Factor 6 explained 3.9% of the total variance.

< table 4>

Table 4 shows the mean DQI value for each quintile of individual household factor score for each of the six principal component analysis factors. Households in quintile 1 had the highest factor loading scores and therefore had reported food purchases that were more strongly associated with the dietary pattern (factors 1 to 6) than were households in the other quintiles.

One factor, factor 6, showed a significant, positive, linear association with DQI value; the factor was associated with food and drink purchases that were closer to the RDGS, although the association was weak, and the difference in mean DQI score between the highest and lowest quintile was small. Three factors were associated with food and drink purchases that were further from the RDGS, and could be considered as less-healthy diets (factors 1, 4 and

5). Factor 5 had the highest correlation with DQI value, although the correlation was only modest ($R^2 = 0.260$, $p < 0.001$).

Average DQI values by SIMD were in the expected direction, with households in more deprived areas having lower quality diets than those in less deprived areas; 34.7, 36.5, 36.3, 35.6 and 41.6 for SIMD 1 (most deprived) to SIMD 5 (least deprived) respectively ($p = 0.001$). *Post hoc* analysis indicated that the DQI score of households in the least deprived areas (SIMD 5) were higher than quintiles 1 to 4 inclusive (all $p < 0.002$).

Households in the most deprived areas (SIMD 1) tended to follow the three "unhealthy" diets as there were statistically significant linear associations between factor scores and SIMD for factors 1, 4 and 5 ($p = 0.001$, $p = 0.030$ and $p = 0.013$ respectively) (table 5). A significant linear association was also seen for factor 2 and SIMD ($p = 0.002$), although factor 2 was not linearly associated with diet quality (table 2). Although the associations between these factor scores and SIMD were statistically significant, the relationships were weak.

< table 5 >

Discussion

Six dietary patterns were identified from the reported food and drink purchases of households in Scotland. Four of these showed statistically significant associations with a Diet Quality Index based on the Revised Dietary Goals for Scotland. Three of these were negatively associated with meeting the goals, and one was positively associated.

A strength of the study was the relatively large sample size from across the whole of Scotland. Unlike many dietary intake surveys, food and drink purchase data were collected continuously for periods that spanned many months, capturing purchases of items that tend to be only infrequently purchased by households in Scotland, such as oil rich fish.

The methodology of the original data collection imposes some limitations on the analyses that need to be considered when interpreting the results.

The KWP data used for these analyses do not include food and drinks that were consumed outside the home, or takeaway foods, and around 10% of energy intake is therefore not captured (DEFRA, 2013). Similar studies suggest that the types of foods eaten inside and outside the home differs, but with the latter, in 2012, contributing only 1% and 2% of total fruit and vegetable intakes respectively (DEFRA, 2014). For red and processed meat, and fish and fish-based dishes, the proportions were higher, at around 7% and 9% respectively (DEFRA, 2014). The effects of omitting eaten out food will have been relatively small for fruits and vegetables intakes and larger, but still less than 10%, for meat and fish intakes. Furthermore, there is evidence that not all food and drink purchases that are brought into the home are recorded, mainly affecting alcoholic drinks and soft drinks when expenditure is compared to other purchase data (such as the Living Costs and Food Survey) and national accounts (Leicester, 2012). Under-reporting of foods when recording dietary intake is common, if not universal, across all methods of self-reported dietary assessment (Stubbs et al., 2014). The number of households achieving some of the RDGS (fruits and vegetables, oil rich fish and fibre) will, therefore, have been underestimated, but overestimated for other RDGS (red and processed meat, salt and possibly percentage energy from sugar).

Previous studies conducted at several times show that, on average, the population of Scotland has failed to achieve all of the previous dietary targets (Wrieden and Barton, 2015). Although there has been some improvement in the intakes of some foods and nutrients, these changes have been very small (Wrieden et al., 2013).

Three of the goals, percentage energy from sugar, fibre and dietary energy density, appear particularly difficult to achieve with less than 5% of households in the current study meeting these goals (values not given here).

The results of this study showing decreasing achievement of the RDGS with increasing level of socio-economic deprivation supports earlier studies that have used different survey data. In both the Scottish Health Survey and Expenditure and Food Survey a linear association of decreasing Diet Quality Index score with increasing level of deprivation (quintile of SIMD) was observed (Armstrong et al., 2009).

Four of the six dietary patterns identified showed statistically significant associations with DQI values. The remaining two factors (2 and 3) appeared to have an inverted "U" shaped relationship with DQI value, with higher DQI values towards the middle of the range of factor scores. This may be because some food groups were positively associated with factors 2 and 3, while others were negatively associated. The effect on DQI of higher intakes of some food groups will be balanced by the opposite effect on DQI of greater amounts of other food groups. For example, fruits and vegetables are positively associated with factor 2, and sugar snacks are negatively associated. Following the dietary pattern described by factor 2 could contribute to the total DQI score a value of 10 for fruits and vegetables, and 0 for percentage energy intake from sugar, while not following the dietary pattern at all could contribute 0 for fruits and vegetables, and 10 for percentage energy intake from sugar. The relationship between amounts of food groups and DQI score is complex, however, as some food groups will contribute to more than one RDGS, and some will contribute in opposite directions – the added sugar in food will increase percentage energy from sugar (tending to lower DQI score) but also lowering the percentage energy from fat and SFA (increasing DQI score). The remaining factors (4, 5 and 6) had statistically significant linear relationships with DQI, but they explained less of the variance, and fewer food groups had factor score coefficients > 0.3 or < -0.3. These dietary patterns are difficult to interpret and describe succinctly and although distinct statistically, are less useful practically.

Although four dietary patterns had significant associations with DQI values, the difference in DQI value between the two extreme quintiles of any dietary pattern was relatively small. Factor 5, which had the greatest difference in mean DQI value between quintiles one and five had a difference of 20 points – equivalent to achieving two additional RDGS, and considerably greater than the improvement reported in the average diet in Scotland between 2001 and 2009 (Armstrong et al., 2009). The RDGS, and hence the DQI, do not consider all aspects of the diet, however, and there may be bigger differences in diet quality across levels of deprivation than is apparent in these results. Furthermore, the DQI is similar to most other diet quality scores and indexes in that the same weighting is applied to all dietary components, and it is possible to obtain similar DQI values with quite different diets.

Although factor 5 had the greatest difference in mean DQI value between quintiles one and five, few food groups were strong contributors to the factor 5 dietary pattern. This dietary pattern was associated with lower DQI scores; alternatively, this can be viewed as not following the dietary pattern is associated with higher DQI scores. Although there was only one food group with a strong negative loading (low-fat dairy products) there were many food groups with negative factor loadings that were just below the -0.3 value chosen for identifying important contributors to the dietary pattern. Lower consumption of many of these food groups (such as red meat, white bread, chips, cake and jam) would tend to lead to a diet closer to meeting the RDGS.

This study identified four dietary patterns that had statistically significant associations with meeting more of the Revised Dietary Goals for Scotland. Investigation of dietary patterns to show which foods tend to be purchased together may assist in targeting dietary habits to nudge in the direction of healthier choices, and in gaining the greatest improvement in diet quality for the most achievable change.

Conflicts of Interest

The authors declare that there is no conflict of interest.

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Table 1. Components of the Diet Quality Index and scoring criteria.		
Component	**Scottish Dietary Goal**	**Scoring criteria**
Energy Density	Average energy density of the diet to be lowered to 125 kcal/100g	≤ 125kcal/100g = 10 >125kcal/100g = 0
Fruits and vegetables	Average intake of a variety of fruits and vegetables to reach > 400g per person per day	Scaled from 0 for 0g per day to a maximum of 10 for ≥ 400g per day.
Oil rich fish	Oil rich fish consumption to increase to one portion per person (140g) per week (= 20 g per day)	Scaled from 0 for 0g per day to a maximum of 10 for ≥ 20g per day.
Red and processed meat	Average intake of red and processed meat to be pegged at around 70g per person per day	≤ 70g per day = 10 > 70 g per day = 0
%Energy carbohydrate	Total carbohydrate to be maintained at an average population intake of approximately 50% of total dietary energy with no more than 5% total energy from free sugars	≥ 40% and ≤ 60% = 10 < 40% = 0 > 60% = 0
%Energy sugar	Average intake of free sugars, not to exceed 5% of total energy in adults and children over 2 years	≤ 5% energy = 10 > 5% energy = 0

%Energy total fat	Average intake of total fat to reduce to no more than 35% food energy	≤ 35% energy = 10 > 35% energy = 0
%Energy saturated fat	Average intake in saturated fat to reduce to no more than 11% food energy	≤ 11% energy = 10 > 11% energy = 0
%Energy trans fat	Average intake of trans fatty acids to remain below 1% food energy	Not scored [1]
Salt	Average intake of salt to reduce to 6g per day	≤ 6g per day =10 > 6g per day = 0
Fibre	An increase in average consumption of AOAC fibre for adults (16+) to 30g/day. Dietary fibre intakes for children to increase in line with SACN recommendations	Scaled from 0 for 0% of requirements to a maximum of 10 for ≥ 100% of requirements.

[1] scoring not possible because nutrient information is not collected by Kantar Worldpanel.

Table 3. Principal components and corresponding factor scoring coefficients from the 26 food groups.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Ready meals	0.568	0.060	0.122	-0.181	-0.238	0.027
Meat - red	0.562	0.035	-0.380	-0.204	-0.251	-0.134
Bread - white	0.500	-0.255	-0.186	0.039	-0.152	0.016
Savoury snacks	0.492	-0.265	0.175	-0.082	0.404	-0.107
Table sauces	0.462	0.341	0.094	-0.063	0.131	0.358
Pasta	0.434	0.418	0.199	-0.076	0.236	-0.099
Meat - white	0.426	-0.088	0.009	-0.316	-0.222	-0.217
Chips	0.418	-0.053	-0.071	-0.097	-0.216	0.037
Cheese	0.403	0.294	0.172	0.042	0.335	-0.084
Potatoes	0.392	0.098	-0.332	0.179	-0.132	0.136
Soft drinks - diet	0.389	-0.108	0.261	-0.140	0.241	0.234
Breakfast cereal - Low Fibre	0.336	-0.129	0.276	0.174	0.038	-0.306
Pulses	0.334	0.193	0.153	0.114	-0.128	0.317
Desserts	0.325	-0.287	0.312	0.120	-0.066	0.140
Soft drinks - regular	0.290	-0.207	-0.267	-0.105	0.133	0.089
Sugar snacks	0.277	-0.535	0.234	0.136	0.208	0.015
Fruit & vegetables	0.169	0.480	0.182	0.187	-0.037	-0.131
Fish – oil rich	0.135	0.417	-0.042	-0.179	-0.237	-0.187
Biscuits	0.236	-0.413	0.292	0.310	-0.036	-0.039
Rice	0.155	0.365	0.104	0.015	0.241	-0.072
Cake	0.114	-0.353	0.036	0.082	-0.281	-0.052
Fish - white	0.256	0.318	-0.091	-0.208	-0.138	0.027
Oil & fat - cooking	0.215	0.115	-0.479	0.127	0.272	0.304
Breakfast cereal - High fibre	-0.126	0.248	0.437	0.223	-0.079	-0.136

Eggs	0.212	0.227	-0.334	0.175	-0.263	-0.028
Bread - High fibre	-0.126	0.212	0.273	0.001	-0.147	-0.185
Flour	-0.100	0.297	-0.211	0.561	0.215	0.170
Sugar	0.070	0.008	-0.284	0.510	0.139	-0.025
Alcohol	-0.110	0.184	-0.183	-0.471	0.246	0.129
Spread - High fat	0.265	0.029	-0.342	0.449	-0.025	-0.247
Jam	-0.004	0.127	0.237	0.424	-0.261	0.203
Dairy - high fat	0.255	-0.179	-0.166	0.325	0.190	-0.279
Nuts	-0.032	0.128	0.120	-0.017	0.412	-0.126
Dairy - low fat	0.047	0.114	0.345	0.064	-0.409	0.071
Spread - Reduced fat	0.026	0.102	0.288	0.199	-0.136	0.546
Sandwich fillers	0.065	-0.159	0.053	-0.186	0.090	0.283
Meat alternatives	0.134	0.256	0.249	-0.005	0.169	-0.273
Slimming products	0.021	-0.121	0.071	-0.107	0.155	0.192
Variance explained	8.9%	6.4%	5.8%	5.4%	4.7%	3.9%

Values > 0.3 and < -0.3 are highlighted in bold. Authors' calculations from Kantar Worldpanel data.

Table 4. Mean Diet Quality Index score for each quintile of individual household factor scores calculated from six principal component analysis factors in 720 households in Scotland.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Quintile 1	30.8	35.2	37.3	37.3	28.9	40.9
Quintile 2	33.9	38.6	39.5	34.7	32.5	40.3
Quintile 3	37.2	39.7	38.5	37.3	36.2	36.9
Quintile 4	40.9	38.3	36.8	40.0	41.2	36.1
Quintile 5	45.0	36.0	35.7	38.4	49.0	33.7
ANOVA	<0.001	0.017	0.166	0.009	<0.001	<0.001
Regression (R^2)						
against DQI	0.144	0.000	0.002	0.007	0.260	0.034
P	<0.001	0.911	0.247	0.036	<0.001	<0.001

Households in quintile 1 had the highest factor loading scores and therefore had reported food purchases that were more strongly associated with the dietary pattern (factors 1 to 6) than were households in the other quintiles. Authors' calculations from Kantar Worldpanel data.

Table 5. Mean factor scores of the Principal Components Analysis by quintile of Scottish Index of Deprivation.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
SIMD 1 (most deprived)	0.186	0.255	-0.135	0.196	0.170	0.028
SIMD 2	0.072	0.045	0.022	-0.033	0.009	-0.064
SIMD 3	0.070	-0.006	-0.059	-0.004	0.091	-0.009
SIMD 4	-0.045	0.067	-0.008	-0.068	0.073	-0.028
SIMD 5 (least deprived)	-0.235	-0.255	0.017	-0.138	-0.255	0.058

Regression (R^2) factor score and SIMD	0.016	0.015	0.001	0.007	0.010	0.000
P	0.001	0.002	0.448	0.030	0.013	0.668