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Small Area Estimation of Sport Participation and Activity using data from the Active Lives Survey

Prepared for Sport England

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1 Background

Small area estimation (SAE) is a technique used to generate estimates in small geographical areas that would otherwise have too few respondents from the survey to derive precise direct estimates. This approach was used to generate area estimates for the 6,791 Middle Super Output Areas (MSOAs) in England for the following measures: participation in sport (at least twice in the past month), inactivity (less than 30 minutes physical activity per week in the past month, excluding gardening), and activity (meeting CMO guidelines of at least 150 minutes physical activity per week in the past month, excluding gardening).

The estimates were generated using data from the 2016/17 Active Lives Survey (ALS). The ALS provides the most comprehensive picture of sports participation in England and is central to Sport England's measurement of its own strategy; with the survey also being used to provide Official Statistics and to help measure the performance of its own partners. The ALS has a large sample size: ALS 2016/17 contained over 192,000 adults, with a minimum sample size of 500 in each English local authority with the exceptions of the Isles of Scilly and the City of London.

2 Method

2.1 Summary of the approach

The approach used to obtain the small area statistics was to model each of the individual-level outcome measures from the Active Lives Survey (ALS) against a set of external area-level covariates collected from a range of sources using a regression model. The parameter estimates from the regression model were then used to directly calculate the predicted prevalence at the area level.

To account for the differing profiles of age and gender across the MSOA, area-level estimates were obtained for each MSOA separately by age and gender groups. This was done by including the individual-level measures of age group and gender from the ALS as covariates in the model and then, for each MSOA, generating a set of predicted prevalences for each age and gender group. These were then combined to give the estimate of prevalence for all adults.

2.2 The MSOA-level measures

The set of MSOA-level measures was produced when the small area estimates were produced previously for the ALS 2015/16 dataset. They were obtained from a range of sources: Census data; ACORN data, the Index of Multiple Deprivation and urban/rural classification. Additional administrative variables were also taken from the Neighbourhood Statistics website and from the Active Places dataset.

A full list of the variables considered is given in Appendix A.

2.3 Modelling the data

The three individual-level outcome measures (participation, inactivity and activity) were extracted from the ALS 2016/17 for participants aged 16 or older, along with gender and age group. This ALS data was then merged with the set of MSOA-level measures.

For each outcome measure, a stepwise logistic regression model was fitted in Stata with the individual-level measures of age group and gender forced into the model and the area-level covariates selected using the forward stepwise procedure. The aim of the regression model is to explain as much of the area-level variance as possible, so those area-level covariates that are the most significantly associated with the outcome measures are included in the final model. In other words, the models are not fitted with the aim of examining relationship, merely to minimise the residual area-level variation. It is for this reason that with small area estimation it is standard that no attempt is made to describe the model.

Multilevel logistic regression models were then fitted in Stata for each of the three outcome measures (see Appendix B). The models contained the

individual-level ALS measures of age group and gender, the set of area-level covariates that were identified by the stepwise logistic regression models and a random effect for the MSOAs.

2.4 Generating the small area estimates

The parameter estimates in the models are used to generate estimates of prevalence in each MSOA for the three outcome measures for each age and gender group. In practice this is done by generating predicted estimates directly from Stata after running the multilevel model. This command multiplies each parameter estimate in the model by its MSOA-level estimate, summing all the MSOA-level terms and then adding the intercept term and appropriate age and gender group parameter estimate; the final sum is then transformed using the inverse logit function.

The final MSOA-level measure is then the weighted average of the MSOA-level prevalence estimates for each age and gender group.

Appendix A: Potential MSOA-level covariates

Variable name	Variable label	Source
IMDscore	Index of Multiple Deprivation (IMD) Score	Deprivation indices 2015, and sources
INCscore	Income Score (rate)	Deprivation indices 2015, and sources
EMPScore	Employment Score (rate)	Deprivation indices 2015, and sources
EDUscore	Education, Skills and Training Score	Deprivation indices 2015, and sources
HLTscore	Health Deprivation and Disability Score	Deprivation indices 2015, and sources
CRIScore	Crime Score	Deprivation indices 2015, and sources
HOUscore	Barriers to Housing and Services Score	Deprivation indices 2015, and sources
ENVscore	Living Environment Score	Deprivation indices 2015, and sources
IDACIscore	Income Deprivation Affecting Children Index (IDACI) Score (rate)	Deprivation indices 2015, and sources
IDAOPIscore	Income Deprivation Affecting Older People (IDAOP) Score (rate)	Deprivation indices 2015, and sources
CYPSDscore	Children and Young People Sub-domain Score	Deprivation indices 2015, and sources
SKILLSDscore	Adult Skills Sub-domain Score	Deprivation indices 2015, and sources
GEOSDscore	Geographical Barriers Sub-domain Score	Deprivation indices 2015, and sources
BARSDscore	Wider Barriers Sub-domain Score	Deprivation indices 2015, and sources
INDSDscore	Indoors Sub-domain Score	Deprivation indices 2015, and sources
OUTSDscore	Outdoors Sub-domain Score	Deprivation indices 2015, and sources
educationpost16	Staying on in education post 16 indicator	Deprivation indices 2015, and sources
entryhighered	Entry to higher education indicator	Deprivation indices 2015, and sources
adult_english_prof	Adult skills and English language proficiency indicators - combined	Deprivation indices 2015, and sources
lifelostindicator	Years of potential life lost indicator	Deprivation indices 2015, and sources
disabilityindicator	Comparative illness and disability ratio indicator	Deprivation indices 2015, and sources
morbidityindicator	Acute morbidity indicator	Deprivation indices 2015, and sources
anxietyindicator	Mood and anxiety disorders indicator	Deprivation indices 2015, and sources
kmto_post	Road distance to a post office indicator (km)	Deprivation indices 2015, and sources
kmto_school	Road distance to a primary school indicator (km)	Deprivation indices 2015, and sources
kmto_store	Road distance to general store or supermarket indicator (km)	Deprivation indices 2015, and sources
knto_gp	Road distance to a GP surgery indicator (km)	Deprivation indices 2015, and sources
overcrowding	Household overcrowding indicator	Deprivation indices 2015, and sources
homelessness	Homelessness indicator	Deprivation indices 2015, and sources
houseafford	Housing affordability indicator	Deprivation indices 2015, and sources
housepoor	Housing in poor condition indicator	Deprivation indices 2015, and sources
housesnoheat	Houses without central heating indicator	Deprivation indices 2015, and sources

airquality	Air quality indicator	Deprivation indices 2015, and sources
roadaccidents	Road traffic accidents indicator	Deprivation indices 2015, and sources
RUC11CD	Urban rural indicator - code	ONS
Child_development	Children achieving a good level of development at age 5	Public Health England website
Crude_fertility_rate	Crude fertility rate, 2010-14	Public Health England
GCSE_achievement	GCSE achievement (5 A*-C incl. Eng & Maths)	Public Health England
Low_birth_weight	Births with birth weight less than 2500g as a proportion of live and still births with valid weight, 2010-14	Public Health England
Obese_Y6_kids	Percentage of measured children in Year 6 who were classified as obese, 2012/13-2014/15	Public Health England
OutOfWork_claimants	% of the working age population who are claiming out of work benefit, 2015/16	Public Health England
English_proficiency	Proficiency in English (% of people who cannot speak English well or at all)	Public Health England
Provide_care	Provision of Unpaid Care - 1 or more hours per week	Public Health England
healthy_life_m	Healthy life expectancy at birth (male)	Public Health England
Hospital_stays_alcohol	Hospital Admissions for Alcohol Attributable Harm (narrow definition)	Public Health England
Admissions_all	Emergency Admissions, All Causes	Public Health England
Incidence_cancer_all	Incidence of all cancers	Public Health England
census_0_15	proportion population age 0-15	Census 2011 data
census_16_24	proportion population age 16-24	Census 2011 data
census_25_34	proportion population age 25-34	Census 2011 data
census_35_44	proportion population age 35-44	Census 2011 data
census_45_54	proportion population age 45-54	Census 2011 data
census_55_64	proportion population age 55-64	Census 2011 data
census_65_74	proportion population age 65-74	Census 2011 data
census_75plus	proportion population age 75+	Census 2011 data
census_males	proportion males	Census 2011 data
census_white	proportion from white ethnic background	Census 2011 data
census_ukborn	proportion born in UK	Census 2011 data
census_christian	proportion christianity	Census 2011 data
census_noreligion	proportion with no religion	Census 2011 data
census_working	proportion working - Ft, PT or self employed	Census 2011 data
census_unemployed	proportion unemployed	Census 2011 data
census_retired	proportion retired	Census 2011 data
census_student	proportion student ft	Census 2011 data
census_homemaker	proportion home/family	Census 2011 data
census_SIC_A	proportion SIC_A	Census 2011 data
census_SIC_B	proportion SIC_B	Census 2011 data
census_SIC_C	proportion SIC_C	Census 2011 data
census_SIC_D	proportion SIC_D	Census 2011 data
census_SIC_E	proportion SIC_E	Census 2011 data
census_SIC_F	proportion SIC_F	Census 2011 data
census_SIC_G	proportion SIC_G	Census 2011 data
census_SIC_H	proportion SIC_H	Census 2011 data
census_SIC_I	proportion SIC_I	Census 2011 data
census_SIC_J	proportion SIC_J	Census 2011 data
census_SIC_K	proportion SIC_K	Census 2011 data
census_SIC_L	proportion SIC_L	Census 2011 data

census_SIC_M	proportion SIC_M	Census 2011 data
census_SIC_N	proportion SIC_N	Census 2011 data
census_SIC_O	proportion SIC_O	Census 2011 data
census_SIC_P	proportion SIC_P	Census 2011 data
census_SIC_Q	proportion SIC_Q	Census 2011 data
census_Ilti	proportion long term illness	Census 2011 data
census_noQual	proportion no qualifications	Census 2011 data
census_level1Qual	proportion level 1 qualifications	Census 2011 data
census_level2Qual	proportion level 2 qualificaion	Census 2011 data
census_ApprenticeQual	proportion apprenticeships	Census 2011 data
census_level3Qual	proportion level 3 qualifications	Census 2011 data
census_level4Qual	proportion level 4 qualifications	Census 2011 data
census_nssec_1_2	proportion NSSEC 1&2 (professiona/managerial)	Census 2011 data
census_NSSEC_3	proportion NSSEC_3	Census 2011 data
census_NSSEC_4	proportion NSSEC_4	Census 2011 data
census_NSSEC_5	proportion NSSEC_5	Census 2011 data
census_NSSEC_6	proportion NSSEC_6	Census 2011 data
census_NSSEC_7	proportion NSSEC_7	Census 2011 data
census_NSSEC_8	proportion NSSEC_8	Census 2011 data
census_ownerocc	proportion owner occupiers/buying with mortgage	Census 2011 data
census_rent_socal	proportion social renters	Census 2011 data
census_rent_private	proportion private renters	Census 2011 data
census_Dwelling_Detached	proportion individuals in Detached	Census 2011 data
census_Dwelling_Semidetached	proportion individuals in Semidetached	Census 2011 data
census_Dwelling_Terrace	proportion individuals in Terrace	Census 2011 data
census_Dwelling_Flat_Purpose	proportion individuals in Flat_Purpose	Census 2011 data
census_Dwelling_Flat_Converted	proportion individuals in Flat_Converted	Census 2011 data
census_Dwelling_Flat_Commercial	proportion individuals in Flat_Commercial	Census 2011 data
census_Dwelling_Mobile	proportion individuals in Mobile	Census 2011 data
census_depchildren	proportion families without dependent children	Census 2011 data
census_nocars	proportion households with no car	Census 2011 data
census_TTW_home	proportion_mode of travel to work_home	Census 2011 data
census_TTW_underground_tram	proportion_mode of travel to work_underground_tram	Census 2011 data
census_TTW_train	proportion_mode of travel to work_train	Census 2011 data
census_TTW_bus_coach	proportion_mode of travel to work_bus_coach	Census 2011 data
census_TTW_taxi	proportion_mode of travel to work_taxi	Census 2011 data
census_TTW_motorbike	proportion_mode of travel to work_motorbike	Census 2011 data
census_TTW_car_van	proportion_mode of travel to work_car_van	Census 2011 data
census_TTW_passenger	proportion_mode of travel to work_passenger	Census 2011 data
census_TTW_bike	proportion_mode of travel to work_bike	Census 2011 data
census_TTW_foot	proportion_mode of travel to work_foot	Census 2011 data
census_TTW_Other	proportion_mode of travel to work_Other	Census 2011 data
census_TTW_No_Work	proportion_mode of travel to work_Do not work	Census 2011 data

Acorn_Category	Acorn_Category	ACORN 2016
Acorn_pCat1	Proportion in ACORN cat A	ACORN 2016
Acorn_pCat2	Proportion in ACORN cat B	ACORN 2016
Acorn_pCat3	Proportion in ACORN cat C	ACORN 2016
Acorn_pCat4	Proportion in ACORN cat D	ACORN 2016
Acorn_pCat5	Proportion in ACORN cat E	ACORN 2016
Acorn_pCat6	Proportion in ACORN cat F	ACORN 2016
popdens	Population density of MSOA (households/area in hectares)	Census/Geog info
SupergroupName	ONS area classification - Supergroup Name	ONS
ave_fac_per_site	average number of facilities per site in MSOA	ACTIVE PLACES DATA
proprefurb	proportion of facilities in MSOA that have been refurbished	ACTIVE PLACES DATA
propdisabaccess	proportion of facilities in MSOA that have disabled access	ACTIVE PLACES DATA
accessfree_per000	number of free access facilities per 1000 residents	ACTIVE PLACES DATA
accesspay_per000	number of pay to play access facilities per 1000 residents	ACTIVE PLACES DATA
accessclub_per000	number of club access facilities per 1000 residents	ACTIVE PLACES DATA
accessmember_per000	number of members only access facilities per 1000 residents	ACTIVE PLACES DATA
facpitch_per000	number of pitches (grass or astroturf) per 1000 residents	ACTIVE PLACES DATA
factrack_per000	number of tracks per 1000 residents	ACTIVE PLACES DATA
facpool_per000	number of pools per 1000 residents	ACTIVE PLACES DATA
facgym_per000	number of gyms (studios or health centres) per 1000 residents	ACTIVE PLACES DATA
facsportshall_per000	number of sports halls per 1000 residents	ACTIVE PLACES DATA
facgolf_per000	number of golf courses per 1000 residents	ACTIVE PLACES DATA
factennis_per000	number of tennis courts (outdoors and in) per 1000 residents	ACTIVE PLACES DATA
disabfacs_per000	number of disabled access facilities per 1000 residents	ACTIVE PLACES DATA
mgtocalauth_per000	number of facilities managed by the LA per 1000 residents	ACTIVE PLACES DATA
mgtcommercial_per000	number of facilities managed by a commercial company per 1000 residents	ACTIVE PLACES DATA
mgteducation_per000	number of facilities managed by an education establishment per 1000 residents	ACTIVE PLACES DATA
MYPE2015_allages	Total MSOA population	2015 mid-year population estimates
lake_count	Total number of lakes in the MSOA	lake geo file

Appendix B: Multilevel logistic regression models

Table B1 Model output for sports participation

Variable name	Description	b	SE(b)	z	P > z	Lower 95% CI	Upper 95% CI
Individual measures:							
cons	intercept	1.511	0.319	4.730	0.000	0.886	2.137
age8 (3)	age: 24-34 (baseline = male aged: 16 - 24)	-0.223	0.100	-2.240	0.025	-0.418	-0.028
age8 (4)	age: 36-44	-0.200	0.096	-2.080	0.038	-0.388	-0.011
age8 (5)	age: 45-54	-0.378	0.094	-4.010	0.000	-0.562	-0.193
age8 (6)	age: 55-64	-0.526	0.092	-5.730	0.000	-0.706	-0.346
age8 (7)	age: 65-74	0.195	0.094	2.070	0.039	0.010	0.379
age8 (8)	age: 75+	-0.489	0.096	-5.080	0.000	-0.678	-0.300
Gend3	female	0.017	0.049	0.350	0.727	-0.079	0.113
Gend3 X age8 (3)	female / age: 24-34	0.017	0.059	0.290	0.772	-0.099	0.133
Gend3 X age8 (4)	female / age: 36-44	0.006	0.057	0.110	0.910	-0.106	0.119
Gend3 X age8 (5)	female / age: 45-54	0.041	0.056	0.730	0.464	-0.069	0.152
Gend3 X age8 (6)	female / age: 55-64	-0.028	0.055	-0.510	0.612	-0.135	0.080
Gend3 X age8 (7)	female / age: 65-74	-0.193	0.057	-3.420	0.001	-0.304	-0.083
Gend3 X age8 (8)	female / age: 75+	-0.446	0.058	-7.700	0.000	-0.559	-0.332
MSEA measures:							
census_ukborn	proportion born in UK	1.460	0.163	8.950	0.000	1.140	1.779
SKILLSDscore	Adult Skills Sub-domain Score	-1.262	0.326	-3.870	0.000	-1.900	-0.623
census_TTW_home	proportion_mode of travel to work_home	2.871	0.759	3.780	0.000	1.383	4.358
census_TTW_car_van	proportion_mode of travel to work_car_van	-0.975	0.124	-7.870	0.000	-1.218	-0.732
English_proficiency	Proficiency in English (% of people who cannot speak English well or at all)	0.051	0.007	7.380	0.000	0.038	0.065
disabilityindicator	Comparative illness and disability ratio indicator	-0.002	0.000	-3.770	0.000	-0.002	-0.001
census_SIC_A	proportion SIC_A	-2.736	0.644	-4.250	0.000	-3.998	-1.473
airquality	Air quality indicator	-0.188	0.041	-4.610	0.000	-0.268	-0.108
census_level4Qual	proportion level 4 qualifications	1.200	0.240	5.010	0.000	0.731	1.670
census_unemployed	proportion unemployed	-3.420	0.787	-4.340	0.000	-4.963	-1.876
census_noreligion	proportion with no religion	0.747	0.116	6.440	0.000	0.520	0.975
census_45_54	proportion population age 45-54	2.101	0.511	4.110	0.000	1.099	3.104
educationpost16	Staying on in education post 16 indicator	0.838	0.198	4.240	0.000	0.451	1.225

Variable name	Description	b	SE(b)	z	P > z	Lower 95% CI	Upper 95% CI
census_SIC_C	proportion SIC_C	-0.769	0.212	-3.630	0.000	-1.184	-0.354
census_males	proportion males	-1.706	0.483	-3.530	0.000	-2.652	-0.760
census_homemaker	proportion home/family	-2.334	0.712	-3.280	0.001	-3.728	-0.939
facpool_per000	number of pools per 1000 residents	0.005	0.002	2.690	0.007	0.001	0.009

Table B2 Model output for activity (excluding gardening)

Variable name	Description	b	SE(b)	z	P > z	Lower 95% CI	Upper 95% CI
Individual measures:							
cons	intercept	0.187	0.212	0.880	0.377	-0.228	0.602
age8 (3)	age: 24-34 (baseline = male aged: 16 - 24)	-0.329	0.086	-3.810	0.000	-0.498	-0.160
age8 (4)	age: 36-44	-0.355	0.083	-4.280	0.000	-0.517	-0.192
age8 (5)	age: 45-54	-0.478	0.082	-5.850	0.000	-0.638	-0.318
age8 (6)	age: 55-64	-0.577	0.080	-7.200	0.000	-0.733	-0.420
age8 (7)	age: 65-74	-0.753	0.079	-9.510	0.000	-0.908	-0.597
age8 (8)	age: 75+	-1.389	0.086	16.100	0.000	-1.558	-1.220
Gend3	female	-0.124	0.042	-2.940	0.003	-0.207	-0.041
Gend3 X age8 (3)	female / age: 24-34	0.028	0.051	0.540	0.586	-0.072	0.128
Gend3 X age8 (4)	female / age: 36-44	0.018	0.049	0.370	0.715	-0.078	0.114
Gend3 X age8 (5)	female / age: 45-54	0.051	0.049	1.050	0.295	-0.044	0.146
Gend3 X age8 (6)	female / age: 55-64	-0.014	0.048	-0.300	0.763	-0.108	0.079
Gend3 X age8 (7)	female / age: 65-74	-0.091	0.047	-1.920	0.055	-0.183	0.002
Gend3 X age8 (8)	female / age: 75+	-0.303	0.052	-5.780	0.000	-0.405	-0.200
MSOA measures:							
SKILLSDscore	Adult Skills Sub-domain Score	-0.809	0.233	-3.480	0.001	-1.265	-0.353
airquality	Air quality indicator	-0.167	0.039	-4.330	0.000	-0.243	-0.092
census_noreligion	proportion with no religion	0.618	0.109	5.700	0.000	0.406	0.831
census_level4Qual	proportion level 4 qualifications	1.687	0.177	9.550	0.000	1.340	2.033
Crude_fertility_rate	Crude fertility rate	-0.002	0.001	-3.370	0.001	-0.003	-0.001
census_white	proportion from white ethnic background	0.375	0.113	3.310	0.001	0.153	0.598
census_SIC_I	proportion SIC_I	1.011	0.306	3.300	0.001	0.410	1.611
census_NSSEC_4	proportion NSSEC_4	1.181	0.274	4.310	0.000	0.643	1.718
ONS Supergroup:							
Cosmopolitans							
(baseline = Constrained City							
Supergroup (2)	Dwellers)	0.023	0.052	0.440	0.661	-0.079	0.125
ONS Supergroup: Ethnicity							
Supergroup (3)	Central	0.165	0.053	3.120	0.002	0.061	0.268
ONS Supergroup: Hard-Pressed							
Supergroup (4)	Living	0.016	0.035	0.470	0.638	-0.052	0.084
ONS Supergroup: Multicultural							
Supergroup (5)	Metropolitans	0.047	0.039	1.200	0.230	-0.029	0.122
ONS Supergroup: Rural							
Supergroup (6)	Residents	-0.051	0.041	-1.250	0.211	-0.132	0.029
ONS Supergroup: Suburbanites							
Supergroup (7)		0.033	0.038	0.860	0.388	-0.042	0.107
ONS Supergroup: Urbanites							
Supergroup (8)		0.042	0.036	1.170	0.241	-0.028	0.113
Staying on in education post 16							
educationpost16	indicator	0.808	0.174	4.640	0.000	0.467	1.150

Variable name	Description	b	SE(b)	z	P > z	Lower 95% CI	Upper 95% CI
census_25_34	proportion population age 25-34	-1.042	0.235	-4.430	0.000	-1.503	-0.581
census_TTW_foot	proportion_mode of travel to work_foot	0.769	0.185	4.150	0.000	0.406	1.132
census_Dwelling_Terrace	proportion individuals in Terrace	0.123	0.051	2.410	0.016	0.023	0.223
census_SIC_G	proportion SIC_G	-0.881	0.278	-3.170	0.002	-1.426	-0.337
Acorn_pCat5	Proportion in ACORN cat E	-0.106	0.052	-2.040	0.041	-0.207	-0.004
popdens	Population density of MSOA (households/area in hectares)	0.001	0.000	2.620	0.009	0.000	0.001
census_ukborn	proportion born in UK	0.587	0.164	3.580	0.000	0.265	0.908
English_proficiency	Proficiency in English (% of people who cannot speak English well or at all)	0.022	0.006	3.390	0.001	0.009	0.034

Table B3 Model output for inactivity (excluding gardening)

Variable name	Description	b	SE(b)	z	P > z	Lower 95% CI	Upper 95% CI
Individual measures:							
cons	intercept	-0.564	0.211	-2.680	0.007	-0.977	-0.151
age8 (3)	age: 24-34 (baseline = male aged: 16 - 24)	0.188	0.101	1.860	0.063	-0.011	0.386
age8 (4)	age: 36-44	0.193	0.097	1.980	0.048	0.002	0.383
age8 (5)	age: 45-54	0.395	0.095	4.140	0.000	0.208	0.582
age8 (6)	age: 55-64	0.559	0.093	6.020	0.000	0.377	0.741
age8 (7)	age: 65-74	0.783	0.091	8.570	0.000	0.604	0.962
age8 (8)	age: 75+	1.434	0.096	14.960	0.000	1.246	1.621
Gend3	female	-0.003	0.050	-0.060	0.951	-0.100	0.094
Gend3 X age8 (3)	female / age: 24-34	0.010	0.060	0.160	0.874	-0.108	0.127
Gend3 X age8 (4)	female / age: 36-44	0.017	0.058	0.280	0.776	-0.097	0.130
Gend3 X age8 (5)	female / age: 45-54	-0.032	0.057	-0.570	0.571	-0.144	0.079
Gend3 X age8 (6)	female / age: 55-64	0.032	0.055	0.570	0.566	-0.077	0.141
Gend3 X age8 (7)	female / age: 65-74	0.087	0.055	1.580	0.113	-0.021	0.194
Gend3 X age8 (8)	female / age: 75+	0.307	0.058	5.310	0.000	0.193	0.420
MSOA measures:							
OutOfWork_claimants	% of the working age population who are claiming out of work benefit	0.034	0.010	3.580	0.000	0.015	0.053
SKILLSDscore	Adult Skills Sub-domain Score	0.889	0.303	2.930	0.003	0.294	1.484
census_ukborn	proportion born in UK	-1.482	0.159	-9.350	0.000	-1.793	-1.171
census_TTW_home	proportion_mode of travel to work_home	-3.914	0.728	-5.370	0.000	-5.341	-2.486
census_TTW_carvan	proportion_mode of travel to work_car_van	0.597	0.131	4.570	0.000	0.340	0.853
Crude_fertility_rate	Crude fertility rate	0.002	0.001	3.080	0.002	0.001	0.004
census_noreligion	proportion with no religion	-0.570	0.119	-4.810	0.000	-0.803	-0.338
English_proficiency	Proficiency in English (% of people who cannot speak English well or at all)	-0.046	0.007	-6.700	0.000	-0.060	-0.033
census_SIC_A	proportion SIC_A	3.341	0.730	4.580	0.000	1.911	4.772
educationpost16	Staying on in education post 16 indicator	-0.790	0.193	-4.100	0.000	-1.169	-0.412
roadaccidents	Road traffic accidents indicator	-0.087	0.032	-2.730	0.006	-0.149	-0.025
airquality	Air quality indicator	0.217	0.044	4.990	0.000	0.132	0.302
census_level4Qual	proportion level 4 qualifications	-1.342	0.232	-5.790	0.000	-1.796	-0.888
census_SIC_C	proportion SIC_C	0.780	0.212	3.690	0.000	0.365	1.195
census_45_54	proportion population age 45-54	-1.464	0.497	-2.940	0.003	-2.438	-0.489
RUC11CD (2)	urban/rural: B1 (baseline = A1)	-0.004	0.035	-0.120	0.901	-0.073	0.064
RUC11CD (3)	urban/rural: C1	-0.028	0.019	-1.430	0.151	-0.065	0.010

Variable name	Description	b	SE(b)	z	P > z	Lower 95% CI	Upper 95% CI
RUC11CD (4)	urban/rural: C2	0.152	0.120	1.260	0.206	-0.084	0.388
RUC11CD (5)	urban/rural: D1	-0.019	0.029	-0.680	0.495	-0.076	0.037
RUC11CD (6)	urban/rural: D2	-0.344	0.109	-3.160	0.002	-0.557	-0.131
RUC11CD (7)	urban/rural: E1	0.005	0.039	0.120	0.901	-0.072	0.082
RUC11CD (8)	urban/rural: E2	-0.095	0.093	-1.020	0.307	-0.277	0.087
lifelostindicator	Years of potential life lost indicator	0.003	0.001	3.420	0.001	0.001	0.005
census_homemaker	proportion home/family	2.383	0.736	3.240	0.001	0.941	3.825

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