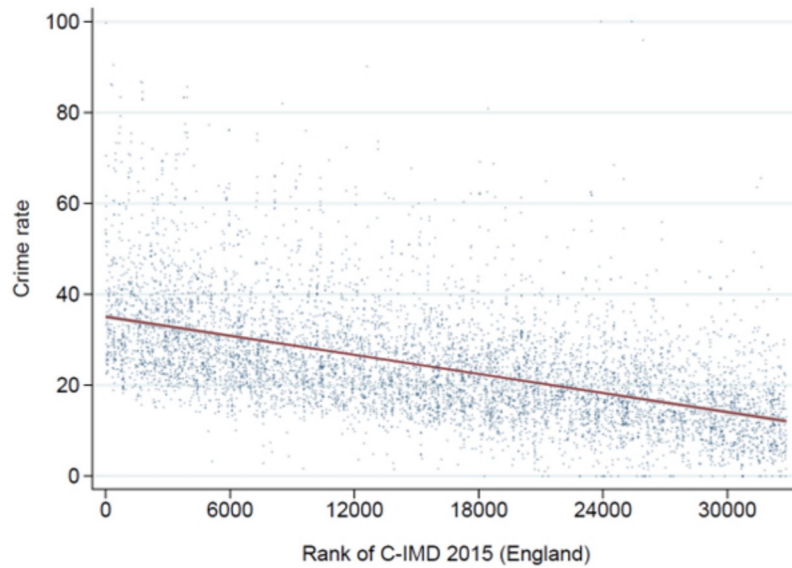


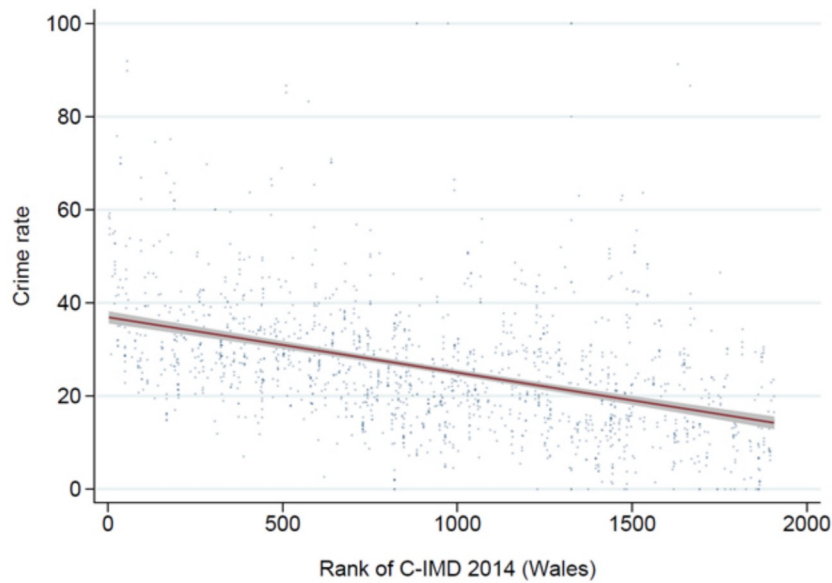
Supplementary Appendix

Supplementary Figure 1: Association between Crime rates (1600-metre buffer and 3-month period) and LSOAs ranks of C-IMD, MCS survey 6 (age 14), by country

Panel A. England



Panel B. Wales



Notes: Panel A and B show a scatter plot with a linear prediction between the Crime rates (1600-metre buffer and 3-month period) per 1,000 population for England and Wales, respectively. The estimated slope, once scaled up by 1,000, in England is -0.7 ($P < 0.000$, $R^2 = 0.29$) and for Wales is -1.2 ($P < 0.000$, $R^2 = 0.19$), after scaled up by 100.



Supplementary Table 1: OLS estimates for total crime rates (3-month, 1600-metre buffer) MCS sweep 6 (age 14), by country

	England		Wales	
	Coef.	95% CI	Wales	95% CI
Crime Domain IMD	−6.52***	[−7.00, −6.04]	−6.06***	[−7.38, −4.75]
White ethnicity	−1.68***	[−2.69, −0.68]	−8.47	[−18.89, 1.96]
Decile of household income				
1 = lowest income	Ref		Ref	
2	−2.37***	[−3.82, −0.92]	−1.85	[−6.57, 2.88]
3	−3.03***	[−4.46, −1.60]	−1.23	[−4.74, 2.27]
4	−3.46***	[−4.97, −1.95]	−2.83	[−6.82, 1.17]
5	−3.23***	[−4.78, −1.68]	−2.88	[−7.92, 2.16]
6	−3.83***	[−5.42, −2.24]	−2.76	[−7.62, 2.10]
7	−4.88***	[−6.46, −3.30]	−2.35	[−7.40, 2.69]
8	−4.26***	[−5.92, −2.59]	−4.92*	[−9.98, 0.14]
9	−5.07***	[−6.73, −3.40]	−5.86**	[−10.50, −1.21]
10 = highest income	−4.54***	[−6.49, −2.59]	−7.67***	[−12.93, −2.41]
Housing tenure				
Rent house or other	Ref		Ref	
Own house	−0.15	[−0.98, 0.68]	1.94*	[−0.19, 4.07]
Maternal Education				
NVQ level 1	−0.03	[−1.59, 1.54]	−0.96	[−6.43, 4.51]
NVQ level 2	0.17	[−1.15, 1.49]	0.31	[−4.65, 5.28]
NVQ level 3	−0.65	[−2.06, 0.76]	1.12	[−4.00, 6.24]
NVQ level 4	−0.34	[−1.54, 0.86]	0.65	[−4.35, 5.64]
NVQ level 5	Ref		Ref	
Overseas qualification	0.99	[−0.83, 2.81]	5.95	[−6.43, 18.33]
Other	−0.26	[−1.76, 1.23]	1.67	[−3.68, 7.01]
Constant	24.93***	[22.84, 27.03]	34.29***	[23.09, 45.48]
Police Force Fixed Effects	Yes		Yes	
Observations	7817		1640	
R ²	0.407		0.238	

Notes: 95% confidence interval in brackets. *p < 0.10, **p < 0.05, ***p < 0.001. Standard errors are clustered at LSOA level, and estimates are weighted using MCS derived sampling weights. Missing income was imputed using the mean of household income at sweep 6. Missing data on ethnicity and housing tenure were imputed using the mode.

Supplementary Table 2: Total crime counts percentiles (20th, 40th, 60th and 80th) by MCS surveys

	MCS 5 (age 11)	MCS 6 (age 14)	MCS 7 (age 17)
P20	113	111	106
P40	318	307	326
P60	581	550	592
P80	1083	1016	1091
P80/P20	9.6	9.2	10.3

Notes: Estimates are weighted using MCS derived weights.

Supplementary Table 3: Crime rates and counts by crime categories (1600-metre buffer and 3-month period)

	Rates			Counts		
	11	14	17	11	14	17
Total	26.8 [25.7,27.8]	24.3 [23.3,25.2]	26.4 [25.3,27.5]	708 [624,791]	659 [586,732]	695 [620,770]
Anti-social behaviour	10.4 [9.8,11.0]	8.3 [7.8,8.8]	5.9 [5.5,6.3]	256 [230,283]	205 [186,224]	147 [132,163]
Burglary	2.3 [2.2,2.4]	1.9 [1.7,2.0]	1.8 [1.7,1.9]	58 [51,64]	47 [42,52]	48 [42,54]
Criminal damage and arson	2.7 [2.6,2.8]	2.5 [2.3,2.6]	2.6 [2.4,2.7]	62 [57,67]	59 [55,64]	60 [55,65]
Drugs	0.9 [0.8,0.9]	0.6 [0.6,0.7]	0.5 [0.5,0.6]	28 [23,33]	20 [16,24]	17 [14,20]
Public disorder and weapons	0.6 [0.6,0.6]	0.9 [0.8,0.9]	1.9 [1.7,2.0]	18 [16,21]	27 [23,32]	50 [44,55]
Robbery	0.3 [0.2,0.3]	0.2 [0.2,0.2]	0.3 [0.2,0.3]	14 [10,18]	9 [7,12]	12 [9,15]
Shoplifting	1.3 [1.2,1.4]	1.4 [1.3,1.5]	1.5 [1.4,1.7]	33 [30,36]	38 [35,42]	40 [36,44]
Vehicle crime	1.8 [1.6,1.9]	1.6 [1.5,1.7]	1.8 [1.7,2.0]	49 [42,56]	46 [40,53]	55 [45,64]
Violence and sexual offences	2.9 [2.7,3.0]	4.2 [4.0,4.4]	7.1 [6.7,7.4]	80 [70,90]	119 [104,134]	178 [162,195]
Others	3.6 [3.4,3.8]	2.8 [2.6,2.9]	3.0 [2.9,3.2]	108 [89,128]	87 [72,102]	88 [73,102]

Notes: The table shows means with 95% confidence interval estimated using the MCS survey design (in parenthesis). Rates columns show crime rates per 1000 population. Counts columns indicate the total counts of crime incidents.



Supplementary Table 4: OLS estimates for the association between household income deciles at age 11, and crime rates at age 14

	Crime rate (age 14)					
	Model 1		Model 2		Model 3	
	Coef.	95% CI	Coef.	95% CI	Coef.	95% CI
Decile of household income (age 11)						
1 = lowest income	14.21*** ^a	[8.49,19.93]	6.86***	[3.98,9.75]	4.47***	[2.16,6.79]
2	10.90***	[6.91,14.89]	4.70***	[2.31,7.08]	2.89***	[0.92,4.86]
3	9.58***	[5.94,13.23]	4.58***	[2.53,6.63]	2.97***	[1.30,4.64]
4	6.62***	[3.87,9.37]	2.33***	[0.59,4.07]	1.2	[-a0.32,2.72]
5	5.57***	[3.12,8.02]	2.84***	[1.30,4.38]	1.79***	[0.46,3.13]
6	3.45***	[1.47,5.43]	1.30**	[0.07,2.53]	0.5	[-0.61,1.61]
7	2.96***	[1.32,4.60]	1.37**	[0.30,2.44]	0.73	[-0.31,1.77]
8	1.89**	[0.45,3.33]	1.31***	[0.43,2.20]	0.75*	[-0.04,1.54]
9	0.46	[-0.65,1.57]	0.31	[-0.39,1.01]	-0.19	[-0.89,0.50]
10 = highest income	Ref.		Ref.		Ref.	
White	-2.28**	[-4.05,-0.52]	0.32	[-0.74,1.37]	-0.7	[-1.68,0.29]
Housing tenure						
Rent house or other	Ref.		Ref.		Ref.	
Own house	0.15	[-1.45,1.75]	0.78	[-0.25,1.82]	0.12	[-0.78,1.01]
Working status						
Both in work	Ref.		Ref.		Ref.	
Main in work, partner not	-0.95	[-3.74,1.85]	-1.95	[-4.41,0.52]	-1.39	[-3.67,0.89]
Partner in work, main not	-1.62***	[-2.66,-0.59]	-1.13***	[-1.83,-0.42]	-0.97***	[-1.62,-0.32]
Both not in work	-0.97	[-3.38,1.43]	-0.82	[-2.38,0.74]	-0.41	[-1.71,0.89]
Main in work or on leave, no partner	-1.89**	[-3.42,-0.36]	-1.09*	[-2.18,0.00]	-0.72	[-1.69,0.25]
Main not in work nor on leave, no partner	-3.46***	[-5.97,-0.94]	-2.64***	[-4.20,-1.07]	-1.85***	[-3.11,-0.60]
Maternal Education						
NVQ level 1	0.17	[-1.96,2.31]	-0.16	[-1.44,1.13]	-0.02	[-1.22,1.18]
NVQ level 2	-0.1	[-1.89,1.69]	-0.1	[-1.09,0.90]	0.02	[-0.94,0.98]
NVQ level 3	-0.74	[-2.46,0.98]	0.14	[-0.99,1.27]	0.19	[-0.90,1.29]
NVQ level 4	-1.35*	[-2.87,0.17]	-0.35	[-1.22,0.53]	-0.24	[-1.10,0.61]
NVQ level 5	Ref.		Ref.		Ref.	
Overseas qualification	0.5	[-2.15,3.14]	-0.39	[-2.14,1.37]	0.01	[-1.71,1.72]
Other	-0.27	[-2.34,1.81]	-0.48	[-1.72,0.75]	-0.31	[-1.48,0.87]
Number of siblings in the household	-0.23	[-0.65,0.20]	-0.09	[-0.37,0.19]	0.04	[-0.22,0.30]
Country						
England	Ref.		Ref.		Ref.	
Wales	1.93*	[-0.31,4.17]	0.26	[-0.90,1.41]	0.24	[-3.80,4.28]
Crime Rate (age 11)			0.69***	[0.64,0.73]	0.67***	[0.63,0.72]
Constant	21.77***	[19.23,24.30]	3.27***	[1.51,5.03]	2.92***	[1.09,4.74]
Police Force Fixed Effect	No		No		Yes	
R ²	0.119		0.629		0.659	
Training (80% sample) MSE=	150.37		56.22		51.76	
Test (20% sample) MSE=	132.29		57.50		52.55	
Observations	7586		7586		7586	

Notes: 95% confidence interval in brackets. *p < 0.10, **p < 0.05, ***p < 0.01. Standard errors are estimated considering the MCS sampling design, and estimates are weighted using MCS derived sampling weights. NVQ = National Vocational Qualifications. Missing income was imputed using the mean of household income at sweep 6. Missing data on ethnicity, housing tenure, working status, and maternal education were imputed using the mode. Binary variables for missing data were included (but not reported) in the table. A train/test split was used to prevent overfitting. We used the splitsample command in Stata and split the sample as 80% for training (n = 6069) and 20% for test (n = 1517). We used the parameters estimated on the training data to compute out-of-sample prediction in the test data, and the Mean Squared Error (MSE) in the training and test data was reported.

Supplementary Table 5: OLS estimates for the association between household income deciles at age 11, and crime rates at age 17

	Crime rate (age 17)					
	Model 1		Model 2		Model 3	
	Coef.	95% CI	Coef.	95% CI	Coef.	95% CI
Decile of household income (age 11)						
1 = lowest income	19.89***	[14.46,25.31]	11.00***	[7.62,14.39]	5.21***	[2.47,7.96]
2	15.31***	[11.34,19.29]	8.24***	[5.24,11.24]	3.56***	[1.12,6.00]
3	13.77***	[9.60,17.93]	7.69***	[4.94,10.44]	3.51***	[1.37,5.64]
4	9.32***	[6.57,12.06]	4.72***	[2.54,6.90]	1.76*	[-0.10,3.62]
5	7.27***	[4.84,9.69]	4.11***	[2.53,5.69]	1.56**	[0.16,2.96]
6	4.74***	[2.53,6.96]	2.22***	[0.74,3.70]	0.36	[-0.94,1.65]
7	4.41***	[2.51,6.31]	2.70***	[1.15,4.25]	0.96	[-0.44,2.35]
8	2.54***	[1.04,4.03]	2.02***	[0.97,3.06]	0.73	[-0.23,1.68]
9	0.89	[-0.19,1.97]	0.73*	[-0.12,1.58]	-0.41	[-1.16,0.35]
10 = highest income	Ref.		Ref.		Ref.	
White	-1.15	[-2.77,0.48]	1.30**	[0.07,2.52]	-0.12	[-1.09,0.84]
Housing tenure						
Rent house or other	Ref.		Ref.		Ref.	
Own house	0.66	[-0.69,2.01]	0.72	[-0.42,1.87]	-0.65	[-1.72,0.41]
Working status						
Both in work	Ref.		Ref.		Ref.	
Main in work, partner not	-3.15***	[-5.22,-1.09]	-4.54***	[-6.80,-2.28]	-2.79***	[-4.86,-0.73]
Partner in work, main not	-1.84***	[-3.16,-0.52]	-1.43***	[-2.33,-0.52]	-0.54	[-1.29,0.22]
Both not in work	-2.72**	[-5.32,-0.12]	-1.95*	[-4.06,0.17]	-0.87	[-2.49,0.75]
Main in work or on leave, no partner	-2.79***	[-4.61,-0.98]	-1.71***	[-3.00,-0.42]	-0.54	[-1.66,0.57]
Main not in work nor on leave, no partner	-5.80***	[-8.43,-3.17]	-4.88***	[-6.69,-3.07]	-2.75***	[-4.32,-1.19]
Maternal Education						
NVQ level 1	0.87	[-1.69,3.44]	0.53	[-1.26,2.31]	0.97	[-0.62,2.56]
NVQ level 2	0.03	[-1.86,1.92]	0.06	[-1.20,1.33]	0.64	[-0.61,1.89]
NVQ level 3	-0.39	[-2.30,1.52]	0.31	[-1.08,1.71]	0.77	[-0.57,2.11]
NVQ level 4	-1.03	[-2.57,0.52]	-0.05	[-1.23,1.13]	0.17	[-0.98,1.32]
NVQ level 5	Ref.		Ref.		Ref.	
Overseas qualification	0.77	[-2.57,4.12]	-0.45	[-2.52,1.62]	0.12	[-1.69,1.94]
Other	0.29	[-2.17,2.76]	-0.54	[-2.20,1.12]	0.07	[-1.41,1.56]
Number of siblings in the household	-1.08***	[-1.59,-0.58]	-0.67***	[-1.03,-0.31]	-0.29*	[-0.62,0.04]
Country						
England	Ref.		Ref.		Ref.	
Wales	2.14	[-0.50,4.77]	0.36	[-1.16,1.88]	2.84	[-4.67,10.35]
Crime Rate (age 11)			0.71***	[0.65,0.76]	0.69***	[0.64,0.75]
Constant	22.55***	[20.09,25.01]	4.13***	[1.64,6.61]	3.96***	[1.51,6.41]
Police Force Fixed Effect	No		No		Yes	
R ²	0.112		0.548		0.607	
Training (80% sample) MSE =	197.49		106.84		101.94	
Test (20% sample) MSE =	175.44		97.56		92.01	
Observations	7586		7586		7586	

Notes: 95% confidence interval in brackets. *p < 0.10, **p < 0.05, ***p < 0.01. Standard errors are estimated considering the MCS sampling design, and estimates are weighted using MCS derived sampling weights. NVQ= National Vocational Qualifications. Missing income was imputed using the mean of household income at sweep 6. Missing data on ethnicity, housing tenure, working status, and maternal education were imputed using the mode. Binary variables for missing data were included (but not reported) in the table. A train/test split was used to prevent overfitting. We used the splitsample command in Stata and split the sample as 80% for training (n=6069) and 20% for test (n=1517). We used the parameters estimated on the training data to compute out-of-sample prediction in the test data, and the Mean Squared Error (MSE) in the training and test data was reported.

Supplementary Table 6: OLS estimates for the association between household income deciles at age 11, and crime rates at age 14 and 17

	Crime rate (age 14)		Crime rate (age 17)	
	Coef.	95% CI	Coef.	95% CI
Decile of household income (age 11)				
1 = lowest income	4.44***	[2.04,6.83]	4.43***	[1.62,7.24]
2	2.88 ^o **	[0.84,4.92]	3.03**	[0.65,5.40]
3	2.92***	[1.19,4.66]	2.70**	[0.58,4.82]
4	1.19	[-0.37,2.74]	1.56	[-0.32,3.45]
5	1.79***	[0.44,3.14]	1.31	[-0.27,2.90]
6	0.56	[-0.57,1.70]	0.48	[-0.80,1.76]
7	0.72	[-0.33,1.78]	0.49	[-0.68,1.66]
8	0.74 ^o	[-0.05,1.54]	0.75	[-0.26,1.77]
9	-0.20	[-0.89,0.50]	-0.56	[-1.37,0.24]
10 = highest income	Ref.		Ref.	
Ethnicity				
White	Ref.		Ref.	
Other	-0.70	[-1.68,0.28]	-0.15	[-1.14,0.84]
Housing tenure				
Rent house or other	Ref.		Ref.	
Own house	0.15	[-0.77,1.07]	-0.14	[-1.01,0.72]
Working status				
Both in work	Ref.		Ref.	
Main in work, partner not	-1.37	[-3.65,0.91]	-1.57**	[-3.03,-0.10]
Partner in work, main not	-0.98***	[-1.63,-0.32]	-0.44	[-1.24,0.35]
Both not in work	-0.37	[-1.67,0.94]	-0.17	[-1.76,1.42]
Main in work or on leave, no partner	-0.70	[-1.68,0.29]	-0.32	[-1.50,0.85]
Main not in work nor on leave, no partner	-1.81***	[-3.08,-0.54]	-1.76**	[-3.27,-0.25]
Maternal Education				
NVQ level 1	-0.01	[-1.22,1.19]	0.57	[-0.93,2.06]
NVQ level 2	0.04	[-0.92,1.01]	0.52	[-0.76,1.80]
NVQ level 3	0.19	[-0.91,1.29]	0.79	[-0.50,2.07]
NVQ level 4	-0.23	[-1.09,0.62]	0.19	[-0.91,1.29]
NVQ level 5	Ref.		Ref.	
Overseas qualification	-0.02	[-1.74,1.70]	0.04	[-1.76,1.84]
Other	-0.31	[-1.49,0.87]	0.28	[-1.21,1.77]
Number of siblings in the household	0.04	[-0.21,0.30]	-0.14	[-0.44,0.15]
Country				
England	Ref.		Ref.	
Wales	0.23	[-3.83,4.28]	2.05	[-3.88,7.98]
Crime Rate (age 11)	0.68***	[0.63,0.72]	0.69***	[0.65,0.74]
Constant	2.87***	[1.04,4.70]	3.00***	[0.91,5.09]
Police Force Fixed Effects	Yes		Yes	
Observations	7586		7586	

Notes: 95% confidence interval in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are estimated considering the MCS sampling design, and estimates are weighted using MCS derived sampling weights. NVQ = National Vocational Qualifications. Multiple imputation by chained equation combining 20 datasets was used to impute missing information on housing tenure (1.6%), working status (0.2%), number of siblings (0.9%) and maternal education (0.1%). A multinomial logit model was used for working status and maternal education, a linear model was used for number of siblings, and a Logistic model was used for housing tenure. Predictors in multiple imputation models included ethnicity, deciles of household income and country.