Public Health England

Protecting and improving the nation's health

Supplementary tables for the inequalities in oral health report

Contents

Table S1.1 Socio-economic position and clinical outcomes (dental caries, periodontal disease, tooth loss, dental trauma, oral cancer)

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Dental caries					
Aldossary et al. 2015 (1)	DMFT	Observa-tional, cross-sectional	Education; household income; social class (Registrar General)	3,235 dentate adults aged ≥16 years; from 1998 ADHS	For all three SEP measures, linear social gradients in number of decayed and number of missing teeth (p-value for trend <0.001 for all six tests). For all three SEP measures, reverse gradients for number of filled teeth (p-value for trend < 0.001 for social class; p-value for trend = 0.034 for income; p-value for trend = 0.150 for education). DMFT highest among those with no qualifications; those with the lowest household income; and those in the middle social class groups (gradients for DMFT not entirely linear but p-value for trend <0.001 for all three tests).
Bernabe et al. 2011 (2)	DMFT	Observa-tional, cross-sectional	Parental employment	886 15–16 year olds from Research with East London Adolescents Community Health Survey (RELACHS)	Social gradient by parental employment status. Mean DMFT = 0.93 among adolescents with two employed parents; mean DMFT = 1.36 among adolescents with one unemployed parent; and mean DMFT = 1.72 among adolescents with two unemployed parents.
Cheema and Sabbah 2016 (3)	DMFT; number of decayed teeth	Observa-tional, cross-sectional	Education; occupational classification (NS-SEC 3)	6,279 dentate adults aged ≥16 years from 2009 ADHS	Mean DMFT by education: 17.9 among those with no qualifications; 13.5 among those with some qualifications and 12.8 among those with degree or above. Mean DMFT by social class: 14.4 for routine and manual; 15.5 for intermediate; 14.4 for managerial / professional; and 10.2 for those who never worked.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
					Mean number of decayed teeth by education: no qualifications = 1.22; some qualifications = 1.0; degree or above = 0.67. Mean number of decayed teeth by social class: 1.19 for routine and manual; 0.88 for intermediate; 0.78 for managerial or professional; and 0.93 for those who never worked.
Delgado-Angulo et al. 2016 (4)	DMFT	Observa-tional, cross-sectional	Social class based on occupation (NS-SEC 3); education	2,013 16–65 year olds, from East London Oral Health Inequality (ELOHI) Study	Education: Linear gradient for DMFT, number of decayed teeth and number of missing teeth but no association with number of filled teeth. Mean DMFT = 10.11 among those with higher education and 13.14 among those with no qualifications. Social class: not associated with DMFT or number of missing teeth. Linear gradient for number of decayed teeth (mean DT among managerial or professional occupations = 0.67 and among routine or manual occupations = 1.95); reverse gradient in number of filled teeth (mean FT = 6.94 among managerial or professional occupations vs. 4.84 among routine or manual).
Donaldson et al. 2008 (5)	Number of sound teeth	Observa-tional, cross-sectional	Household income; social class (Registrar General)	3,817 participants (mean age 43 years), from the 1998 ADHS	Results of structural equation models assessing pathways between socio-economic status (SES) and oral health. SES (combined social class and income) predicted number of sound teeth: one level increase in SES associated with a mean increase of 1.5 sound teeth. Association between SES and number of sound teeth partially explained by pathway SES – barriers to dental attendance –dental attendance – number of sound teeth.
Maliderou et al. 2006 (6)	DMFT	Observa-tional, cross-sectional	Occupational classification (social class)	60 children aged 5 to 16 years from London surgery	Children from social groups I, II and III had significantly lower DMFT scores. Average DMFT for social group I children = 0.5 ± 0.6; for group IV children = 4.6 ± 0.8.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Steele et al. 2015 (7)	Presence of decay; unrestorable teeth due to decay; DMFT	Observa-tional, cross-sectional	Social class based on occupation (NS-SEC); income, education	5,084 dentate adults aged ≥21, from 2009 ADHS	Multiple regression adjusted for all three SEP measures simultaneously, and for IMD, age, sex, marital status, region, long-standing illness, and self-assessed health. Probability of any caries 11% higher among the lowest compared to highest income group (p<0.01), and 7% higher among those with no qualifications compared to those with degree level or above (p<0.01). In age-stratified analyses, inequalities by income significant only up to age 50. Probability of having ≥1 unrestorable teeth 9% higher among lowest compared to highest income group (p<0.01), and 4% higher among those with no qualifications compared to those with degree level or above (p<0.05). Probability of having ≥1 unrestorable teeth 2% higher among routine and manual compared to managerial and professional occupations (p<0.01).
Treasure et al. 2001 (8)	Presence of decayed, unsound teeth; unrestorable teeth due to decay	Observa-tional, cross-sectional	Social class based on occupation; education	3,817 dentate adults aged 16+, from 1998 ADHS	Multiple logistic regression predicting odds of having any decayed / unsound teeth and having any unrestorable teeth, adjusted for age, gender, region, social class, education, marital status, use of dental hygiene products. Education reference group: degree level or above. OR for ≥1 decayed / unsound teeth for no qualifications group about 1.4 (p<0.01), no difference between below degree and degree level; OR for ≥1 unrestorable teeth for no qualifications group about 1.8 (p<0.05), no difference between below degree and degree level. Social class reference group: I/II/IIINM. OR for ≥1 decayed or unsound teeth for IV/ V groups about 1.4 (p<0.01), no sig. difference between I/II/IIINM and IIIM groups; OR for having ≥1 unrestorable teeth for IIIM group about 1.5 (p<0.05); OR for IV/V groups about 1.8 (p<0.01).

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Vernazza et al. 2016 (9)	Prevalence of obvious decay	Observa-tional, cross-sectional	Free school meal (FSM) eligibility	9,866 children aged 5, 8, 12 and 15 years from 2013 Child Dental Health Survey	At all ages, those eligible for free school meals were more likely to have obvious decay experience than those not eligible (age 5 years: 52% versus 37%; age 8 years: 64% versus 46%; age 12 years: 46% versus 30%; age 15 years: 59% versus 43%).
White et al. 2012 (10)	Prevalence of visible decay	Observa-tional, cross-sectional	Social class based on occupation (NS-SEC)	Dentate adults aged 16 and over, from 2009 ADHS (sample size not reported)	24% of dentate adults from managerial and professional occupations had one or more teeth affected by caries compared to 28% of those from intermediate occupations and 36% of those from routine and manual occupations.
Periodontal disease					
Alikutty & Bernabé 2016 (11)	Pocket depth (PD) ≥4mm; loss of attachment (LOA) ≥4mm	Observa-tional, cross-sectional	Education; Social class (Registrar General)	3,272 dentate adults aged ≥16 years from the 1998 UK ADHS	Rate ratios (RR) from negative binomial regression. Higher level of education and higher social class associated with having fewer teeth with PD ≥4mm and LOA ≥4mm. With no qualifications as reference group, unadjusted RR for degree or above =0.54 for PD ≥4mm (p<0.001) and RR=0.35 for LOA ≥4mm (p<0.001); adjusted for age, sex, dental attendance, UK country and social class RR=0.79 for PD ≥4mm (p=<0.05) and RR=0.55 for LOA ≥4mm (p<0.001). With highest social class as reference group, unadjusted RR for lowest social class =1.36 for PD ≥4mm (p<0.001) and RR=1.45 for LOA ≥4mm (p<0.001); adjusted for age, sex, dental attendance, UK country and education RR=1.26 for PD ≥4mm (p=<0.05) and RR=1.15 for LOA ≥4mm (not significant).

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Bower et al. 2007 (12)	Presence of periodontal pockets of ≥4mm	Observa-tional, cross-sectional	Social class (Registrar General); education; income	503 Scottish dentate adults from 1998 ADHS	In multilevel regression models adjusted for age, sex and all three SEP indicators simultaneously, none of the SEP measures were significantly related to periodontal pocketing of 4mm or more. Note: main focus of the study were associations between area deprivation and oral health (see Table 2.1).
Delgado-Angulo et al. 2016 (13)	Pocket depth (PD) ≥4mm; loss of attachment (LOA) ≥4mm	Observa-tional, cross-sectional	Social class based on occupation (NS-SEC 3); education	1925 16–65 year olds, from East London Oral Health Inequality (ELOHI) Study	Number of teeth with PD≥4 mm unrelated to education and social class. Number of teeth with LOA≥4 mm lowest among those with higher education (p-value for trend = 0.018); and those with managerial or professional occupations (p-value for trend = 0.035). Associations not linear.
Habibian et al. 2001 (14)	Plaque score	Observa-tional, longitudinal	Maternal education; social class	163 children born 1995 to 1996 in Mid-Surrey; surveyed at 12 and 18 months	At 12 months, among children of mothers with high school education 12% had visible plaque vs. 21% among children whose mothers had a degree (difference not significant). At 18 months, visible plaque found among 21% of children whose mothers had high school education and among 31% of children whose mothers had a degree (difference not significant). No differences by social class.
Moore et al. 2001 (15)	Plaque score, pocket depth, loss of attachment, bleeding on probing	Observa-tional, cross-sectional	Social class based on occupation (Registrar General)	2,027 pregnant women aged 14 to 45 years attending Guy's Hospital in London	In unadjusted comparisons, compared to those in occupational classes I and II, those in classes III/IV/V had higher mean plaques scores, mean bleeding scores and mean probing depth. No significant differences in loss of attachment. In regression analyses adjusted for age, ethnicity, smoking and plaque scores, only probing depth and bleeding scores associated with social class.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Ramsay et al. 2015 (16)	Loss of attachment, periodontal pocket, gingival bleeding	Observa-tional, cross-sectional	Social class based on occupation (Registrar General)	1,246 dentate men aged 71 to 92 years from the British Regional Heart Study	Those from manual social classes had a higher prevalence of attachment loss (>20% sites affected among 21% of those from non-manual occupations vs. 28% of those from manual occupations, p-value = 0.006). No statistically significant differences for pocket depth and gingival bleeding.
Steele et al. 2015 (7)	Presence of periodontal pockets of ≥6mm	Observa-tional, cross-sectional	Social class based on occupation (NS-SEC); income; education	5,067 dentate adults aged ≥21, from 2009 ADHS	Multiple regression models adjusted for all three SEP measures simultaneously, and additionally for IMD, age, sex, marital status, region, long-standing illness, and self-assessed health. Income not independently associated with pocketing of ≥6mm. Probability of having any pockets of ≥6mm was 4% higher among those with no qualifications compared to those with degree level or above ($p<0.05$); and 2% higher among those in routine and manual occupations compared to those in the managerial and professional social class ($p<0.05$).
Treasure et al. 2001 (8)	Loss of attachment ≥4mm	Observa-tional, cross-sectional	Social class based on occupation; education	3,817 dentate adults aged 16+, from 1998 ADHS	Results from multiple logistic regression models predicting odds of having attachment loss of ≥4mm, adjusted for age, gender, region. Social class unrelated to attachment loss and not included in final model. Education (reference group = education at degree level or above): OR for below degree level about 1.3 ($p<0.05$); OR for those with no qualifications about 1.7 ($p<0.01$).
White et al. 2012 (10)	Presence of periodontal pockets of ≥6mm	Observa-tional, cross-sectional	Social class based on occupation (NS-SEC)	Dentate adults aged 16 and over, from 2009 ADHS	Social gradient: prevalence of periodontal pockets of ≥6mm among adults from professional and managerial households = 7%; among those from intermediate occupation households = 9%; among those from routine and manual occupation households = 11%.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Tooth loss					
Bernabe and Sheiham 2014 (17)	Edentulism (total tooth loss); number of teeth; functional dentition	Observa-tional, three cross-sectional surveys	Social class based on occupation (Registrar General for 1988 and 1998, NS-SEC for 2009)	20,126 adults from 1988, 1998 and 2009 ADHS	Examined time trends in social inequalities (Slope and Relative Index of Inequality). Linear social gradients by social class for all 3 outcomes, in each survey year (adjusted for UK country, sex, age, period and cohort effects). Absolute inequality in total tooth loss decreased over the two decades, while relative inequality increased: between 1988 and 2009 total tooth loss declined by 80% for highest and 48% for lowest social class. Among dentate, absolute and relative inequalities in number of teeth and proportion with functional dentition remained significant and relatively stable over time.
Delgado-Angulo et al. 2016 (13)	Number of teeth	Observa-tional, cross-sectional	Social class based on occupation (NS-SEC 3); education	1925 16–65 year olds, from East London Oral Health Inequality (ELOHI) Study	Linear social gradient in mean number of teeth by education but not by social class. Mean number of teeth = 26.7 among those with no qualifications and 28.6 among those with higher education (p-value for trend <0.001). Mean number of teeth among managerial/professional occupations = 27.8 and among routine/manual occupations = 27.4 (p-value for trend = 0.281).
Guarnizo-Herreno et al. 2015 (18)	Number of missing teeth; edentulism (total tooth loss)	Observa-tional, cross-sectional	Educational attainment; household income	Adults aged ≥25 years from English 2009 ADHS (sample sizes varied by exposure / outcome)	Age-standardised estimates. Linear social gradients by education and income for both outcomes. Age-standardised mean number of missing teeth = 5.7 among those with high and 8.2 among those with low education; and 5.8 among those in the highest income tertile and 7.8 among those in the lowest. Age-standardised prevalence of total tooth loss was 1% among those with high and 10% among those with low levels of education; and 2% among those in the highest income tertile compared to 8% among those in the lowest. Slope index of inequality = 3.66 for inequality by education and 3.12 for income-related inequality.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Jagger et al. 2013 (19)	Edentulism (total tooth loss)	Observa-tional, cross-sectional	Social class based on occupation (Registrar General); education	Scottish adults aged 45 years and over, from Scottish Health Surveys (1995; 1998; 2003; 2008 to 2009)	Study calculated Slope Index of Inequality (SII) and Relative Index of Inequality (RII). Across all survey years and all age groups, prevalence of edentulism was highest for those in lowest social class / with no qualifications and lowest for those in highest social class / with a degree or above. Higher absolute inequalities for older age groups especially for social class; downward trend in absolute inequality over time but only for those under 65 years. Relative inequality (RII) by education significantly increased over time.
Lowe et al. 2003 (20)	Edentulism (total tooth loss)	Observa-tional, cross-sectional	Social class based on occupation	605 men and 664 women aged 25–74 years from Glasgow, MONICA survey in 1992	In age-adjusted analysis stratified by sex, total tooth loss was significantly associated with social class. Men: prevalence of total tooth loss = 13% among non-manual and 35% among manual social classes. Women: prevalence of total tooth loss = 20% among non-manual and 48% among manual social classes.
Nuttall 2001 (21)	Edentulism (total tooth loss)	Observa-tional, cross-sectional	Social class based on occupation (Registrar General)	Scottish adults from ADHS 1972, 1978, 1988 and 1998 (n in 1998 = 1204)	Proportion with total tooth loss declined over time (from 44% in 1972 to 18% in 1998). Social gradients persist over time. In 1972, total tooth loss among social class I, II and IIINM = 33%; among IIIM = 41% and among IV/V = 53%. In 1998, total tooth loss among social class I, II and IIINM = 12%; among IIIM = 20% and among IV/V = 28%.
Pearce et al. 2004 (22)	Number of retained teeth	Observa-tional, longitudinal	Social class based on occupation (Registrar General), in	337 adults, born 1947 and followed up to age 50 years, from Newcastle	Among women, number of retained teeth increased with increasingly advantaged social class (p for trend = 0.001). Social class during childhood also significant predictor of the number of retained teeth in women (p=0.008), but not after adjustment for adult social class.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
			childhood and at age 50	Thousand Families Study	Association between childhood SEP and number of retained teeth at age 50 mediated by adult SEP.
Pearce et al. 2005 (23)	Number of teeth lost	Observa-tional, longitudinal	Social class based on occupation (Registrar General)	337 adults, born 1947 and followed up to age 50 years, from Newcastle Thousand Families Study	Median number of teeth lost and Interquartile range (IQR) at age 50 years: Social class at birth: social class I and II (highest) = 6 (4-6); social class III = 8 (5-13); social class IV and V (lowest) = 9 (6-18). Social class at age 50: For social class I and II (highest) = 6 (4-10); social class III = 8 (6-13); social class IV and V (lowest) = 12 (7-21).
Pearce et al. 2009 (24)	Functional dentition, defined as having more than 20 teeth	Observa-tional, longitudinal	Social mobility trajectories from birth to age 50 years	337 adults, born 1947 and followed up to age 50 years, Newcastle Thousand Families Study	Social class at birth based on parental occupation. Social gradients found for retaining a functional dentition by social mobility trajectories (statistically significant for women only). Men: compared to stable non-manual group, those in stable manual group were 57% less likely to have retained a functional dentition at age 50 (OR = 0.43; 95% CI 0.14-1.31). Results for women: compared to stable non-manual group, those in stable manual group were 94% less likely to have retained a functional dentition at age 50 (OR = 0.06; 95% CI 0.02-0.23).
Ramsay et al. 2015 (16)	Number of teeth (total tooth loss, having more than 20 teeth)	Observa-tional, cross-sectional	Social class based on occupation (Registrar General)	2,147 British men aged 71–92 years; British Regional Heart Study	Prevalence of total tooth loss among men from manual social classes was 27%, compared to 14% among men from non-manual social classes. Proportion of men with ≥21 teeth was 26% among manual social classes versus 44% among non-manual social classes. Differences statistically significant ($p<0.0001$).

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Rouxel et al. 2015 (25)	Edentulism (total tooth loss)	Observa-tional, cross-sectional	Wealth; Education; labour market status	8210 adults aged 50+ years, English Longitudinal Study of Ageing	Linear social gradient in prevalence of total tooth loss by wealth quintiles: prevalence was 5.1% among richest 5th; 10.5% among second richest; 15.8% among middle group; 23.2 among second poorest and 33.1 among poorest quintile. Prevalence among those with some qualifications was 10.7% vs 31.1% among those with no qualifications. Prevalence among those in employment was 5.7% vs 25.3% among retired.
Shen et al. 2013 (26)	Number of natural teeth	Observa-tional, cross-sectional	Social class based on occupation (Registrar General); education; economic activity	3,946 dentate and edentate adults aged 16+, from 1998 ADHS	Regression analysis mutually adjusted for age, sex, income, education, social class, marital status, region, economic activity: number of teeth increased with rising income; on average, those with some qualifications had 3.5 more teeth than those with no qualifications; those in social class I (highest) had 4.0 more teeth than those in class V (lowest); those retired had on average 0.9 fewer and those in part-time work had 0.6 more teeth than those in full-time work. Adjusted Gini coefficient (where 0 indicates no inequality, and 1 indicates perfect inequality) = 0.68. Gini was lowest among youngest age group and highest for 51-65 year olds.
Starr et al. 2008 (27)	Edentulism (total tooth loss)	Observa-tional, cross-sectional	Education (years); social class based on occupation	201 healthy participants aged 70 plus, from waves 1 and 4 of Healthy Old People in Edinburgh (HOPE) study	51.7% of the sample were edentulous. In logistic regression adjusted for age, sex, education, social class, area deprivation via Carstairs index, objective distance from dentist, participant's estimate of distance from dentist and cognitive ability: social class was independently associated with being edentulous at wave 1 (p=0.019). Education not independently associated with total tooth loss. Unadjusted data not shown.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Steele et al. 2000 (28)	Edentulism (total tooth loss)	Observa-tional, cross-sectional	Social class based on occupation (Registrar General)	3,817 adults aged 16+, from 1998 ADHS	Prevalence of total tooth loss was markedly lower among higher social classes for those aged 45 and older. Similar absolute social class differences in total tooth loss for men and women among 55-64 age group, but at older ages absolute inequalities were greater among men than women.
Steele et al. 2015 (7)	Presence of 3+ unfilled upper spaces; number of natural teeth	Observa-tional, cross-sectional	Social class based on occupation (NS-SEC); income; education	5,404 dentate and edentate adults aged ≥21, from 2009 ADHS	Multiple regression models adjusted for income, education, social class and area deprivation simultaneously, and additionally for age, sex, marital status, region, long-standing illness, and self-assessed health. Social class: those in routine and manual occupations had 1% higher probability of having 3+ unfilled upper spaces ($p<0.001$) and on average 1.16 fewer teeth ($p<0.001$) than managerial and professional groups. Income: those in poorest quintile had a 2% higher probability of having 3+ unfilled upper spaces ($p<0.05$) and on average 0.69 fewer teeth ($p<0.01$) than those in the richest. Education: those with no qualifications had a 2% higher probability of having 3+ unfilled upper spaces ($p<0.01$) and on average 2.79 fewer teeth ($p<0.001$) than those with a degree or above.
Treasure et al. 2001 (8)	Edentulism (total tooth loss); number of teeth	Observa-tional, cross-sectional	Social class based on occupation (Registrar General); education; economic activity	3,817 dentate adults aged 16 plus, from 1998 ADHS	Results from multiple logistic regression models predicting odds of total tooth loss, adjusted for age, region, social class, education and marital status. Social class: compared to those in social classes I,II and IIINM, those in class IIIM were 2.14 times and those in classes IV and V were 2.21 times more likely to be edentulous. Education: compared to those with a degree or above, odds of total tooth loss were 3.95 times higher for those with qualifications below degree level and 8.79 times higher for those with no qualifications.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
					Results from multiple regression models predicting number of teeth, adjusted for age, sex, region, social class, education, employment, marital status, dental attendance and toothbrushing. Number of teeth was higher among those who belonged to a higher social class, had a higher level of education, and were economically active.
Tsakos et al. 2010 (29)	Edentulism (total tooth loss)	Observa-tional, cross-sectional	Education (years)	597 dentate and 517 edentate adults aged 50+ years; from 2004 UK Low Income Diet and Nutrition Survey	Among dentate participants, 38% had up to 9 years of education and 18% had eleven or more years of education. Among edentate participants, 57% had up to 9 years of education and 10% had eleven or more years of education.
Tsakos et al. 2011 (30)	Edentulism (total tooth loss)	Observa-tional, longitudinal	Education; social class (NS-SEC); household wealth; household income; subjective social status; childhood SEP by	6,634 adults aged 50+ years, from waves one (2002 to 2003) and three of English Longitudinal Study of Ageing	SEP measured at wave 1 and tooth loss measured at wave 3 of ELSA. Age-standardised prevalence of total tooth loss presented. Total tooth loss was associated with all six SEP indicators, with stark inequalities and linear social gradients present for each. Prevalence of edentulousness by education: 6.5% among those with a degree vs. 26.7% among those with no qualifications. By social class: 10.8% among managerial and professional occupations vs. 27.7% among semi routine and routine. By income: 10.9% among the richest vs. 24.2% among the poorest tertile. By wealth: 8.6% among the wealthiest vs. 30.5% among the least wealthy tertile. By subjective social status: 11.7% among the highest vs. 27.8% among

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
			parental social class		the lowest rank. By childhood SEP (age 14): 12.4% among highest and 24.8% among lowest parental social class.
Tsakos et al. 2015 (31)	Edentulism (total tooth loss)	Observa-tional, cross-sectional	Education; median household wealth	3,166 adults aged 60+ from baseline sample of English Longitudinal Study of Ageing	Descriptive results not adjusted for age and sex: education and household wealth significantly associated with total tooth loss. Among dentate participants, 12% had a degree or equivalent and 40% had no qualifications. Among edentate participants, 3% had a degree or equivalent and 67% had no qualifications. Median household wealth was £ 161,190 among dentate and £60,030 among edentate participants.
Dental trauma					
Agel et al. 2014 (32)	Traumatic Dental Injuries (TDI); Glendor criteria	Observa-tional, cross-sectional	Parental employment (one or both employed vs. both unemployed)	728 15 to 16 year olds from Research with East London Adolescents Community Health Survey (RELACHS)	Prevalence of TDI was 14.5% among adolescents with at least one employed parent, compared to 22.5% among those whose parents were both unemployed. In multiple logistic regression adjusted for age, sex, ethnicity, overjet and bullying; odds of having experienced a TDI were about 90% higher among adolescents whose parents were both unemployed, compared to those with at least one employed parent (OR = 1.87).
Blokland et al. 2016 (33)	Trauma to permanent incisors; severe trauma	Observa-tional, cross-sectional	Free school meal (FSM) eligibility	6,707 school-children aged 8, 12 and 15, from 2013 Child Dental Health Survey	In multiple logistic regression models, there was no association between FSM and experience of dental trauma, before or after adjustment for age and sex. Also no association between FSM and severe dental trauma.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Odoi et al. 2002 (34)	Traumatic Dental Injuries (TDI)	Observa-tional, case-control study	Father's education	170 children aged 7 to 15 years (85 cases / 85 matched controls); from Royal London Dental School	In logistic regression model, children whose fathers had completed up to 16 years of education were less likely to have traumatic dental injuries than those whose fathers had more than 16 years of schooling (OR = 0.20; p = 0.002).
Oral cancer					
Conway et al. 2010 (35)	Head and neck cancer	Population-based case-control study	Education (number of years of full time education), social class based on occupation (Registrar General)	103 patients aged 24 to 80 years, diagnosed between 2002 and 2004, 91 controls from GP's lists, Scotland	Results from unconditional logistic regression adjusted for age and sex: Those with completed higher education were 87% less likely to have a diagnosis of head and neck cancer compared to those with secondary education (p<0.01). Those with lifetime experience of unemployment were 2.3 times more likely to have a diagnosis of head and neck cancer compared to those never unemployed (p<0.01). Suggestion that having more than 10 years of schooling and being in a non-manual social class were also protective factors, however results did not reach statistical significance.
Conway et al. 2010 (36)	Upper aero-digestive tract (UADT) cancer	Multicentre case–control study	Education; social class	2198 cases of UADT cancer (2002 to 2005) and 2141 controls in 14 centres in 10 European	Results from unconditional logistic regression adjusted for age and sex: UADT cancer significantly increased with lower levels of educational attainment (those with no formal education had 3-fold increased risk compared to those with university education). Lower social class was also associated with increased risk of UADT cancer. In analyses stratified by sex, education and social class gradients were statistically significant only among men. Risk associated with

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
				countries, including 3 UK centres	low educational attainment in men substantially larger in British Isles than in Southern European and Central/ Northern European countries.
Greenwood et al. 2003 (37)	Oral cancer	Case–control study	Unemploy-ment	100 patients aged 34 to 95 years diagnosed at Newcastle General Hospital (1998 to 2000), and 100 matched controls	Cases were significantly more likely to have experienced long-term unemployment than controls (unadjusted OR = 2.91, 95% CI 1.63,51.8). Adjusted for alcohol and smoking, association no longer statistically significant (adjusted OR = 1.40, 95% CI 0.69,2.82).
Nunn et al. 2009 (38)	Referral after oral cancer screening	Retro-spective case–control design	Years of completed education	49 referred patients, matched with 344 controls, oral cancer screening project,Tower Hamlets, London (85% Bangladeshi)	Screened participants with low levels of completed education were more likely to be referred to the secondary care service (ref. category: 19+ years of schooling, unadjusted OR for 15 to 18 years = 2.8 (p=0.04); 14 or fewer = 1.6 (p=0.34); none = 3.6 (p=0.01).

Table S1.2 Socio-economic position and subjective oral health / Oral Health Related Quality of Life

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Subjective / perceived oral health					
Delgado-Angulo and Bernabe 2015 (39)	Persistent trouble with gums or mouth	Observational, longitudinal	Trajectories of inter-generational social mobility (stable manual, stable nonmanual, late steep increase, steady increase)	11,285 participants from 1958 National Child Development Study, followed up to age 33	Trajectories of intergenerational mobility from birth to age 33 identified though latent class growth analysis of social class. Logistic regression adjusted for sex: Those in the stable manual trajectory (most disadvantaged) were 27–37% more likely to report ever having persistent trouble with gums or mouth and 28–39% more likely to report having had persistent trouble with gums or mouth in the last 12 months, compared to those in any of the other three social class trajectories - “suggesting that adult oral health may be more influenced by current rather than past socioeconomic experiences”.
Guarnizo-Herreno et al. 2014 (40)	Self-rated oral health	Observational, cross-sectional	Educational attainment; social class based on occupation (NS-SEC); household income	8,765 dentate and edentate adults aged ≥21 years from 2009 ADHS	Results from logistic regression estimating marginal effects (differences in predicted probabilities) adjusted for age, sex, marital status, geographical location, self-rated general health and long-standing illness. All 3 SEP indicators independently associated with self-rated oral health among dentate but not edentate. For dentate, predicted probability of bad/very bad self-rated oral health (as opposed to very good/good/fair) was 9.1% higher for those with no qualifications compared to those with a degree; 5.1% higher among routine and manual social classes compared to managerial/professional; and 7.4% higher for those in the poorest compared to those in the richest income quintile.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Guarnizo-Herreno et al. 2015 (18)	Self-rated oral health	Observational, cross-sectional	Educational attainment; household income	Adults aged ≥25 years from English 2009 ADHS (n=8,719 for education; n=7,184 for income)	Age-standardised estimates. Linear social gradients by education and income found for reporting 'less than good' oral health. Age-standardised prevalence of less than good self-rated oral health was 24.5% among those with high and 37.4% among those with low levels of education; and 24.0% among those in the highest income tertile compared to 36.4% among those in the lowest. Slope index of inequality = 18.43 for inequality by education and 18.63 for income-related inequality.
Ramsay et al. 2015 (16)	Self-rated oral health; dental problems	Observational, cross-sectional	Social class based on occupation (Registrar General)	2,147 British men aged 71–92 years; British Regional Heart Study	Prevalence of fair/poor self-rated oral health (as opposed to excellent/good) among men from manual social classes was 40%, compared to 31% among men from non-manual social classes ($p<0.001$). Proportion of men reporting one or more dental problems was 39% among manual social classes versus 45% among non-manual social classes ($p=0.007$).
Ravaghi et al. 2016 (41)	Self-rated oral health	Observational, cross-sectional	Free school meal (FSM) eligibility	13,628 children aged 12 and 15 years, from 2013 Child Dental Health Survey	Prevalence of good/very good self-rated oral health (as opposed to fair/poor/very poor) among 12 year olds eligible for FSM was 59% vs. 67% among 12 year olds not eligible. Among 15 year olds eligible for FSM prevalence was 64% vs. 77% among 15 year olds not eligible for FSM.
Rouxel et al. 2015 (25)	Self-rated oral health	Observational, cross-sectional	Wealth (quintiles); education; labour market status	8,210 adults aged 50 years and older, English Longitudinal	Linear social gradient in percentage of respondents rating their oral health as fair or poor (vs. excellent/very good/good) by wealth quintiles: prevalence was 12.8% among richest 5th; 15.0% among second richest; 16.9% among middle group; 21.6 among second poorest and 26.7% among poorest quintile.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
				Study of Ageing	Prevalence among those with some qualifications = 16.6% vs 22.4% among those with no qualifications. Prevalence among those in employment = 18.6% vs 16.6% among retired.
Tsakos et al. 2011 (30)	Self-rated oral health	Observational, longitudinal	Education; social class (NS-SEC); household wealth; household income; subjective social status; childhood SEP	6,634 adults aged 50 years and older, English Longitudinal Study of Ageing	SEP measured at wave 1 and self-rated oral health at wave 3 of ELSA. Age-standardised prevalence of fair or poor (vs. excellent/very good/good) self-rated oral health associated with all six SEP indicators among dentate but not edentate participants. Linear gradients except for social class. Prevalence of poor/fair self-rated oral health among dentate by education: 13.7% among those with a degree vs. 23.1% among those with no qualifications. By social class: 15.8% among managerial and professional occupations vs. 22.4% among semi routine and routine. By income: 15.0% among the richest vs. 21.9% among the poorest tertile. By wealth: 15.0% among the wealthiest vs. 24.8% among the least wealthy tertile. By subjective social status: 11.7% among the highest vs. 28.9% among the lowest rank. By childhood SEP (age 14): 15.7% among highest and 20.7% among lowest parental social class.
Dental pain or facial pain					
Macfarlane et al. 2014 (42)	Facial Pain	Observational, cross-sectional	Education; household income; employment status	500,488 participants aged 37 to 73 years from UK Biobank study	Standardised prevalence of facial pain = 1.89%; standardised prevalence of chronic facial pain = 0.88%. Linear social gradients by income for facial pain and chronic facial pain. Compared to poorest income group, those in the richest were less likely to report facial pain (RR = 0.43) and chronic facial pain (RR = 0.38). Compared to those with university degree, those with no qualifications were more likely to report facial pain

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
					(RR = 1.24) and chronic facial pain (RR = 1.34). Compared to those in paid employment, unemployed were more likely to report facial pain (RR = 1.4) and chronic facial pain (RR = 1.56); and those unable to work due to sickness/disability were much more likely to report facial pain (RR = 3.18) and chronic facial pain (RR = 4.51).
Nuttall et al. 2006 (43)	Dental pain	Observational, cross-sectional	Social class based on parental occupation (NS-SEC)	4,946 school-children aged 5, 8, 12 and 15 years, from 2003 Children's Dental Health Survey	Parent-reported prevalence of toothache (occasionally or more often in past 12 months): overall higher among children from routine/manual social classes, but no consistent social gradients. Prevalence for 5 year olds: 16% among managerial/ professional vs. 22% among routine/manual. For 8 year olds: 14% among managerial/ professional vs. 27% among routine/manual. For 12 year olds: 26% among managerial/ professional vs. 22% among routine/manual. For 15 year olds: 20% among managerial/ professional vs. 25% among routine/manual.
Pau et al. 2007 (44)	Dental pain	Observational, cross-sectional	Social class (non-manual vs. manual)	4,942 adults aged ≥16 years from 1998 ADHS	Toothache in the past 12 months reported by 27% of those from non-manual and 30% of those from manual social classes (unadjusted prevalence). In logistic regression model adjusted for age group and sex, those in manual social classes were 21% more likely to report toothache than those in non-manual social classes.
Ravaghi et al. 2016 (41)	Dental pain	Observational, cross-sectional	Free school meal (FSM) eligibility	13,628 school-children aged 5, 8, 12 and	Parent-reported prevalence of toothache among 5 year olds: 27% among those eligible for FSM vs. 11% among those not eligible. Parent-reported prevalence of toothache among 8 year olds: 23% among those eligible for FSM vs. 17% among those

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
				15 years, from 2013 Child Dental Health Survey	not eligible. Self-reported prevalence of toothache among 12 year olds: 25% among those eligible for FSM vs. 16% among those not eligible. Self-reported prevalence of toothache among 15 year olds: 23% among those eligible for FSM vs. 13% among those not eligible.
Oral Health Related Quality of Life (OHRQoL)					
Fernandes et al. 2006 (45)	OHIP-14 (raw and standar-dised scores; total number of problems reported)	Observational, cross-sectional	Education; employment status	278 adult patients (mean age 32 years) with pathology-free impacted wisdom teeth from 6 GDP practices in Tayside, Scotland	Higher scores = poorer OHRQoL. By education: mean total score was 8.22 among those with no further education vs. 6.09 among those with further education ($p<0.05$). Standardised scores also significantly higher among those with no further education but no significant difference in number of problems. By employment: mean scores, standardised scores and number of problems higher among unemployed than employed, but differences not statistically significant.
Guarnizo-Herreno et al. 2014 (40)	OIDP (any impact with severity rating of 3 or higher); OHIP-14 (≥1 oral impact)	Observational, cross-sectional	Educational attainment; social class based on occupation (NS-SEC); household income	8,765 dentate and edentate adults aged ≥21 years from 2009 ADHS	Results from logistic regression estimating marginal effects (differences in predicted probabilities) adjusted for age, sex, marital status, geographical location, self-rated general health and long-standing illness. All 3 SEP indicators independently associated with OHRQoL among dentate but not edentate. Inequalities larger for younger age groups. Results for dentate participants: Compared to those with a degree, those with no qualifications had 7.5% higher predicted probability of reporting ≥1 oral impact on OHIP-14 and 6.7% higher probability of

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
					severe oral impacts on OIDP. Compared to managerial/professional, those in routine and manual social classes had 4.6% higher predicted probability of reporting ≥1 oral impact on OHIP-14 and 5.1% higher probability of severe oral impacts on OIDP. Compared to richest, those in poorest income quintile had 8.4% higher predicted probability of reporting ≥1 oral impact on OHIP-14 and 7.1% higher probability of severe oral impacts on OIDP.
Guarnizo-Herreno et al. 2015 (18)	OHIP-14, (≥1 oral impact = 'very often' or 'fairly often' on any item)	Observational, cross-sectional	Educational attainment; household income	Adults aged ≥25 years from English 2009 ADHS (n=8,719 education; n=7,184 for income)	Age-standardised estimates reported. Linear social gradients by education and income found for reporting ≥1 oral impact on OHIP-14. Age-standardised prevalence of ≥1 oral impact was 10.3% among those with high and 20.9% among those with low levels of education; and 10.4% among those in the highest income tertile compared to 20.8% among those in the lowest. Slope index of inequality = 13.51 for inequality by education and 14.66 for income-related inequality.
Masood et al. 2017 (46)	OHIP-14 (total score)	Observational, cross-sectional	Education; social class based on occupation (NS-SEC 3)	1,277 participants aged 65 years and older, from 2009 ADHS	Higher scores = poorer OHRQoL. Unadjusted mean OHIP-14 scores by education: degree or above = 2.23; below degree = 2.73; no qualifications = 3.34. By social class: professional = 2.42; intermediate = 3.19; manual = 3.21; unemployed = 3.03. Poisson regression mutually adjusted for age, gender, marital status, education, social class, IMD, active caries, presence of periodontal pockets, PUFA, dental pain, active root caries, tooth wear, bleeding, number of missing teeth, denture wearing, smoking, systemic problems and self-rated general health: those with a degree had lower scores than those with no

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
					qualifications (IRR = 0.78; p<0.05); higher scores for those in manual than than those in professional social classes (IRR = 1.11, p<0.05).
McGrath and Bedi 2000 (47)	Perception of how oral health affects quality of life	Observational, cross-sectional	Social class based on occupation (Registrar General)	Random probability sample of 1,778 adults aged 16 years and older (ONS survey 1997 to 1998)	Those from higher social classes were more likely to state that their oral health enhanced their quality of life (OR = 1.46); and less likely to state that their oral health had a negative effect on their quality of life (OR = 0.74), compared to those from lower social classes.
McGrath and Bedi 2001 (48)	OHRQoL-UK (W)	Observational, cross-sectional	Employment status	Convenience sample of 390 adults	Study tested reliability and validity of the OHRQoL-UK (W) instrument. Higher scores = better OHRQoL. Participants in paid employment and students had similar scores (median = 89 for both groups) on the OHRQoL-UK (W) and these were significantly higher than those for unemployed/disabled (median = 83) and retired (median = 81) participants (p<0.05).
McGrath and Bedi 2002 (49)	16-item OHQoL-UK	Observational, cross-sectional	Social class based on occupation (Registrar General)	Random probability sample of 1,836 adults aged 16 years and older (ONS survey)	Higher scores = better OHRQoL. Unadjusted mean score for higher social classes = 56.4 vs. 52.5 for lower social classes. Regression analysis predicting reduced OHRQoL (= score below median) adjusted for age, sex and number of teeth: Manual / unskilled workers were more likely to have reduced oral health related quality of life compared with professional / non-manual workers (OR =1.42, p<0.01).

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
McGrath and Bedi 2002 (50)	OHRQoL in hermeneu-tic study (open questions); and functionalist study (16 pre-coded items)	Observational, cross-sectional (two surveys in 1998 and 1999)	Social class based on occupation (Registrar General)	Adults aged 16 years and older (ONS surveys; n= 1,865 for hermeneutic and n=1,855 for functionalist study	Study assessed impacts of oral health on quality of life in both positive and negative ways. Hermeneutic study: those from higher social classes were more likely to report that their oral health impacted on their quality of life in one way or another, compared to those from lower social classes (OR = 1.32, 95% CI 1.06, 1.64). Functionalist study: those from higher social classes more likely to report any oral impacts than those from lower social classes (1.62, 95% CI 1.31, 2.01).
McGrath and Bedi 2003 (51)	OHRQoL-UK (W) (total score; score above median of 82)	Observational, cross-sectional	Social class based on occupation (Registrar General)	1,738 adults aged 16 years and older, (ONS survey in 1999)	Higher scores = better OHRQoL. Unadjusted median score for those in higher social classes = 83 and for those in lower social classes = 80 ($p<0.01$). Logistic regression analysis adjusted for age, sex and having more than 20 teeth: Those in higher social classes were 40% more likely than those in lower social classes to have a score above the median (OR=1.40; $p<0.01$).
Nuttall et al. 2006 (43)	Oral health impacts (8 items)	Observational, cross-sectional	Social class based on parental occupation (NS-SEC)	4,946 school-children aged 5, 8, 12 and 15 years, from 2003 Children's Dental Health Survey	Parent-reported oral health impacts (8 items, at the time of the survey validated measures of oral impact in children not yet available). Most frequently reported items (apart from dental pain): impact of teeth/gums/mouth on oral function and impact on self-confidence. No consistent social gradients by social class.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Pearce et al. 2009 (24)	OHIP (49 items, total score)	Observational, longitudinal	Social mobility trajectories from birth to age 50 years (manual to non-manual; stable non-manual; stable manual; non-manual to manual)	337 adults born 1947 and followed up to age 50 years, from Newcastle Thousand Families Study	Social class at birth based on parental occupation. No significant associations between social mobility trajectories and total OHIP scores for either men or women.
Ramsay et al. 2015 (16)	OIDP (≥1 oral impact)	Observational, cross-sectional	Social class based on occupation (Registrar General)	2147 British men aged 71–92 years, British Regional Heart Study	Prevalence of ≥1 oral impact on the OIDP among men from manual social classes was 15%, compared to 13% among men from non-manual social classes. Difference not statistically significant.
Ravaghi et al. 2016 (41)	Child-OIDP (≥1 oral impact); Family Impact Scale (≥1 impact)	Observational, cross-sectional	Free school meal (FSM) eligibility	School-children aged 12 and 15 years, from 2013 Child Dental Health Survey	Prevalence of ≥1 oral impact on Child-OIDP (child self-reported): For 12 year olds: 62% among those eligible for FSM vs. 56% among those not eligible. For 15 year olds: 53% among those eligible for FSM vs. 43% among those not eligible. Parental reports for at least one family impact: parents of 5 year olds: 26% among parents of children eligible for FSM vs. 18% among parents of children not eligible. 8 year olds: 38% among parents of children eligible for FSM vs. 32% among parents of children not eligible. 12 year olds: 37% among parents of children eligible for FSM vs. 30% among parents of children not

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
					eligible. 15 year olds: 37% among parents of children eligible for FSM vs. 35% among parents of children not eligible.
Rouxel et al. 2015 (52)	OIDP for elderly populations (≥1 impact)	Observational, longitudinal	Wealth; education; labour market status	7,899 adults aged 50 years and older, from waves 3 and 5 of English Longitudinal Study of Ageing	SEP measured at wave 3 and OIDP measured at wave 5 of ELSA. Significant social gradients in percentage of respondents reporting ≥1 oral impact. By wealth quintiles: prevalence was 8.7% among richest 5th; 7.2% among second richest; 10.0% among middle group; 12.5% among second poorest and 14.9.0% among poorest quintile. Prevalence among those with some qualifications was 9.7% vs 12.3% among those with no qualifications. Prevalence among those in employment was 9.3%, 10.5% among retired and 13.3% among the 'other' group.
Rouxel et al. 2015 (25)	OIDP for elderly populations (≥1 oral impact)	Observational, cross-sectional	Wealth; education; labour market status	8210 adults aged 50 years and older, English Longitudinal Study of Ageing	Significant social gradients in reporting ≥1 oral impact. By wealth quintiles: prevalence was 5.5% among richest 5th; 7.5% among second richest; 7.3% among middle group; 9.4% among second poorest and 13.0% among poorest quintile. Prevalence among those with some qualifications was 7.6% vs 10.4% among those with no qualifications. Prevalence among those in employment was 6.0% vs 8.9% among retired.
Sanders et al. 2009 (53)	OHIP-14 (total score)	Observational, cross-sectional	Household income	4,064 dentate adults aged 30 years and older, from 1998 ADHS	Higher scores = poorer OHRQoL. Descriptive results not adjusted for age and sex. Mean OHIP-14 score for those in the lowest income quartile = 5.7 vs. 4.7 for those in the highest income quartile (p=0.029).
Shen et al. 2013 (26)	OHIP-14 (reverse coded,	Observational, cross-sectional	Social class based on occupation	3,230 dentate adults aged 16 years and	Higher scores = better OHRQoL. Regression analysis mutually adjusted for age, sex, income, education, social class, marital status, region, economic activity: OHIP-14 significantly

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
	number of problems occurring fairly or very often)		(Registrar General); education; economic activity	older, from 1998 ADHS	increased with rising income; no independent association with education; those in social class I (highest) scored on average 0.86 points higher compared to class V (lowest); those retired scored on average 0.50 points higher and those unemployed scored 0.44 points lower than those in full-time work. Adjusted Gini coefficient (where 0 indicates no inequality, and 1 indicates perfect inequality) = 0.33.
Tsakos et al. 2009 (54)	GOHAI (total scores; prevalence of 'good' OHRQoL = scores 57-60)	Observational, cross-sectional	Education	1,054 community-dwelling adults aged 65+ years, registered with 3 medical practices in London	Analysis of baseline data from RCT on 'Health Risk Appraisal for Older Persons'. Higher GOHAI scores = better OHRQoL. Unadjusted results: 'good' OHRQoL reported by 31.2% participants with a low level of education, 41.3% of those with medium level education, and 47.7% of those with a high level of education ($p<0.001$). Mean scores were 52.2 among those with low, 53.6 among those with medium and 54.4 among those with high levels of education ($p<0.001$). Differences in scores remained statistically significant after adjusting for age and sex.
Tsakos et al. 2011 (30)	OIDP (≥1 oral impact)	Observational, longitudinal	Education; social class (NS-SEC); household wealth; household income; subjective social status; childhood SEP	6,634 adults aged 50 years and older, from waves one and three of English Longitudinal Study of Ageing	SEP measured at wave 1 and OIDP measured at wave 3 of ELSA. Age-standardised prevalence of reporting ≥1 oral impact presented. Oral impacts associated with all six SEP indicators among dentate but not among edentate participants. Gradients not entirely linear. For dentate: Prevalence of ≥1 oral impact by education: 8.2% among those with a degree vs. 9.6% among those with no qualifications. By social class: 7.1% among managerial and professional occupations vs. 9.6% among semi routine and routine. By income: 7.1% among the richest vs. 10.1% among the poorest tertile. By wealth: 6.7% among the

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
					wealthiest vs. 11.4% among the least wealthy tertile. By subjective social status: 6.1% among the highest vs. 14.3% among the lowest rank. By childhood SEP (age 14): 6.7% among highest and 9.2% among lowest parental social class.

Table S1.3 Socio-economic position and oral health related behaviours

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Oral hygiene					
Habibian et al. 2001 (14)	Age started tooth brushing	Observational, longitudinal	Parental social class; maternal education	163 children born 1995 to 1996 at Epsom General Hospital in Mid-Surrey; surveyed at 12 and 18 months	92% of children from non-manual social classes had started brushing at 12 months of age; compared with 85% from manual social classes. Difference was not statistically significant (p=0.3).
Levin & Currie 2009 (55)	Tooth brushing frequency	Observational, cross-sectional	Family Affluence Scale	15,460 pupils (aged 11, 13 and 15 years) from 1998, 2002 and 2006 Health Behaviour of School-aged Children Scotland survey	In binomial multilevel analysis adjusted for age, year and family structure, family affluence was significantly associated with twice daily toothbrushing at all ages. Differences in tooth brushing by FAS were greater at older ages for both boys and girls. 15 year old boys and girls from the highest FAS tertile were 71% more likely to brush their teeth twice a day compared to boys and girls from the lowest FAS tertile (p<0.001).
Levin & Currie 2010 (56)	Tooth brushing frequency	Observational, cross-sectional	Family Affluence Scale (FAS); parental social class (Registrar General);	6,190 pupils (mean age 13.5 years) from 2006 Health Behaviour in School-aged Children (HBSC) Scotland survey	In unadjusted logistic regression, higher family affluence, higher social class and at least one parent working associated with greater odds of twice daily toothbrushing. In multivariable analysis adjusted for perceived parenting, relationship with parents, regular breakfast, regular evening meal, and food poverty, FAS independently associated with brushing twice daily for both boys and girls, with greater odds of

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
			parental employment		tooth-brushing for highest FAS tertile (OR=1.46 for boys; OR=1.44 for girls) compared with lowest FAS tertile.
Levin et al. 2015 (57)	Tooth brushing frequency	Observational cross-sectional	Family Affluence Scale (FAS)	3,577 pupils (mean age 15.5 years) from Health Behaviour in School-aged Children (HBSC) Scotland survey, collected in 2010	Among girls, FAS was independently associated with tooth brushing in multivariable logistic regression analysis. Compared to girls in the low FAS group, girls in the highest FAS group were 55% more likely to brush their teeth twice or more per day ($p<0.001$), adjusted for age, family structure, school type, SIMD and rurality. FAS not independently associated with toothbrushing among boys.
Macfarlane et al. 2011 (58)	Mouthwash use	Observational cross-sectional	Education (secondary school; technical college; university or post-graduate)	3,022 adults aged 25 years and over, from Grampian region of Scotland	Descriptive results not adjusted for age and sex: Percentage of individuals using mouthwash was 50.1% among 'technical college' education group; 44.8% in 'secondary school' group and 39% in the 'university/postgraduate' group ($p<0.001$).
Porter et al. 2016 (59)	Tooth brushing frequency; age started tooth brushing	Observational, cross-sectional	Free school meal eligibility	Children aged 5, 8, 12 and 15 years from 2013 Child Dental Health Survey	Across all age groups, children eligible for FSMs were less likely to brush their teeth twice a day or more compared with non-eligible FSMs children. Among 5 year olds eligible for FSMs, 12% had started brushing before age six months compared to 23% among 5 year olds not eligible for FSM.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Singh et al. 2013 (60)	Tooth brushing frequency	Observational, cross-sectional	Education	10,540 dentate adults (<16 years) from 2009 ADHS	Study assessed social inequalities in clustering of oral health related behaviours. Descriptive analysis not adjusted for age and sex: significant association between tooth brushing and education. Among those with no qualifications, 35.9% brushed less than twice a day; vs. 26.9% among those educated below degree level and 16.2% among those with a degree (p<0.001).
Sugar consumption					
Cribb et al. 2011 (61)	Non-milk extrinsic sugars (NMES) consumption; Intake of foods containing NMES	Observational, cross-sectional	Maternal education	4,124 children (mean age 10.6 years) from Avon Longitudinal Study of Parents and Children (ALSPAC), Bristol, UK	No significant association between maternal education and NMES intake, yet higher educational groups consumed more intrinsic sugars. Sugar confectionery intake decreased with increasing level of education (1.14 g/MJ, 1.18 g/MJ and 0.98 g/MJ respectively), as well as chocolate confectionary and biscuit intake. Intake of buns, cakes & pastries, sugar preserves and sweet spreads, and fruit juice increased with level of education (p>0.001). Consumption of diet soft drinks higher in lowest education group (p<0.001). No significant differences by education for intake of sweetened drinks and puddings.
Dykes et al. 2002 (62)	Adding sugar or sugary foods to the baby's bottle at age 9 months	Observational, cross-sectional	Equivalised family income; social class / employment; maternal education	764 Indian, 593 Pakistani, 477 Bangladeshi, and 548 White mothers from 41 UK Local Authorities	In model adjusted for ethnicity, income, social class/ employment, income support, family credit, access to a car and maternal education: linear social gradient by income - mothers belonging to the poorest income quintile were about five times more likely to add sugary foods to the bottle that mothers from the richest. Those in employed unclassified group were less likely to add sugary foods to the bottle than those in employed non-manual group (very large CI). Maternal education not independently related to the outcome.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Fraser et al. 2000 (63)	Intake of sugary foods; consumption of cakes	Observational, cross-sectional	Education	1,968 adults aged 44+ years, from European Prospective Investigation of Cancer (EPIC) cohort, East Anglia.	Data collected through food frequency questionnaire. Results adjusted for age and sex showed that sugary foods and cakes were consumed at least 20% more often by less educated individuals (both p<0.001). Mean number of servings for sugary foods/day was 2.93 in low and 2.24 in high education groups.
Habibian et al. 2001 (14)	NMES consumption	Observational, longitudinal	Parental social class; maternal education	163 children born 1995 to 1996 at Epsom General Hospital in Mid-Surrey; surveyed at 12 and 18 months	No statistically significant difference in mean frequency of NMES consumption between manual and non-manual social class.
Inchley et al. 2001 (64)	Intake of sugary drinks; sweets or chocolates	Observational, cross-sectional	Family Affluence Scale (FAS)	5,631 Scottish schoolchildren (aged 11, 13 and 15 years) from 1998 Health Behaviour of School-aged Children survey	Data collected through food frequency questionnaire. Daily consumption of sweets or chocolates and sugary fizzy drinks higher among children with disadvantaged background (p<0.001). 81.4% of children in the lowest FAS group ate chocolate every day compared to 71% in the highest FAS group. 82.3% in the lowest FAS children drank sugary drinks daily compared to 56.8% in the highest FAS category.
Ma et al. 2016 (65)	Sugar-sweetened	Observational, cross-sectional	Household income	4,156 children and adults from the National Diet	Modelling study that included estimates for consumption of sugar-sweetened beverages (including fruit juices) by income, adjusted for under-reporting using sales data.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
	beverage consumption			and Nutrition Survey rolling programme (NDNS RP) from 2008 to 12.	Sugar-sweetened drink consumption was highest in low-income households. 32 g/day of free sugar from sugar-sweetened beverages were consumed per person among those in the lowest income group compared to 24 g/day per person in the highest income group.
Porter et al. 2016 (59)	Intake of sugary drinks and sugary snacks	Observational, cross-sectional	Free school meal (FSM) eligibility	Children aged 12 and 15 years from 2013 UK Child Dental Health Survey	Significant differences in sugary drinks intake by FSM eligibility. 26% of 12 and 15 year olds eligible for FSMs reported consuming sugary drinks 4 times a day or more, versus 13% (12 year olds) and 12% (15 year olds) of non-eligible children. No significant differences in sugary snack consumption.
Maguire & Monsivais 2015 (66)	Percentage of daily food energy from non-milk extrinsic sugars (NMES)	Observational, data from 3 cross-sectional surveys	Household income (quintiles); occupational social class (NS-SEC; 7 categories); education (4 categories)	1,491 adults aged 19 years or over from the National Diet and Nutrition Survey 2008 to 2011.	Mean intakes adjusted for age, sex, ethnicity, total energy intake and survey year: those in lowest income group (≤ £14.999) consumed 12.7% of food energy from NMES compared to 10.1% among highest income group (£50.000+)($p<0.001$). Significant trend across income levels. Compared to higher managerial and professional social classes, individuals in routine occupations consumed significantly more NMES (10.8% vs 12.3%, respectively). No significant trend cross occupational groups. Those with no qualifications consumed significantly more NMES than those in the highest education group (12.0% vs 10.7%, respectively). No significant trend for educational levels.
Maliderou et al. 2006 (6)	Sugar intake (g/day); confectionery	Observational, cross-sectional	Social class based on occupation	60 children aged 5 to 16 years from a London surgery	Children in social group I and II consumed less sugar and confectionary items than children in all other groups. Mean intake of sugar for social group I children was 58.3 g/day and for children in group VI 205.9 g/day ($p<0.05$). Children in social

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
	consumption (items/day)				group I consumed 0.23 confectionary items per day compared to 3.6 items among children in social group VI ($p<0.05$).
Mendonça et al. 2016 (67)	Intake of non-milk extrinsic sugars (NMES)	Observational, cross-sectional	Education; social class based on occupation (NS-SEC 3)	793 adults aged 85 years in 2006, from Newcastle 85+ cohort study	Dietary intake assessed by 24-h multiple-pass recall on two non-consecutive days. In multinomial logistic models adjusted for sex, no statistically significant associations between daily NMES intake and education; or daily NMES intake and social class.
Ntouva et al. 2013 (68)	Intake of non-milk extrinsic sugar (NMES); % energy from NMES	Observational, cross-sectional	Education; household income; employment	2,796 adults aged 19 years and over, from the UK Low Income Diet and Nutrition Survey	Dietary data collected via 24-hours recall 'multiple pass' method. Across all age groups, individuals in this low income sample consistently consumed more NMES compared to the general population. Age-adjusted analyses: compared to men who left full-time education at age 15, men who left at age 16 consumed more sugar ($p = 0.028$), whereas those who left aged 18 consumed less sugar ($p = 0.023$). No significant associations between NMES intake and income, or NMES intake and employment among men; no associations between NMES intake and any SEP indicator in women.
Pechey et al. 2013 (69)	Food and drink purchasing	Observational, cross-sectional	Social class (Registrar General)	25,674 UK households from Kantar WorldPanel; data for 52 weeks ending 26th December 2010	Included in study were respondents who provided 3 months of data on their food and drink purchases. Lower social class groups bought greater proportions of their total energy from less healthy food categories (sweet snacks / puddings, and chocolate/confectionary). Higher social class groups purchased a greater percentage of their total energy from total sugars (which include sugars from fruit and vegetables). NMES or free sugars not separately reported.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Rogers and Emmett 2003 (70)	Percentage of energy from non-milk extrinsic sugars (NMES)	Observational, cross-sectional	Maternal education	993 children born in 1991 to 1992 and aged 18 months from the Avon Longitudinal Study of Parents and Children (ALSPAC)	Dietary data via 3-day diet diaries. In unadjusted analysis, NMES intake decreased with increasing maternal educational level (p=0.084). In generalised linear models adjusted for maternal smoking, maternal education and maternal age at delivery, children of mothers in low education group had higher NMES intake (B=0.190) and were 2.13 times more likely to have eaten chocolate than children of mothers in high education group. No differences by education for consumption of biscuits, cakes and sugary drinks.
Rugg-Gunn et al. 2007 (71)	Intake of non-milk extrinsic sugar (NMES); % energy from NMES	Observational, 3 cross-sectional surveys (1980; 1990; 2000)	Parental social class	Children aged 11 to 12 years, from 7 schools in South Northumberland (n=405/379/424 in 1980/1990/2000)	Dietary data via two self-completion 3-day diet diaries. For the whole sample, NMES provided 16% of total energy intake. There were no differences by social class in NMES intake measured in grams or measured as % of total energy in any of the survey years.
Singh et al. 2013 (60)	High sugar consumption	Observational, cross-sectional	Education	10,540 dentate adults (<16 years) from 2009 ADHS	Study assessed social inequalities in clustering of oral health related behaviours. High sugar intake (defined as consumption of cakes, sweets, or fizzy drinks six or more times a week) not significantly associated with education.
Skafida and Treanor 2014 (72)	Intake of sugary drinks excluding fruit juice; and sweets / chocolates	Observational, longitudinal	Changes in household income; subjective income	3,297 children followed from age 2 to age 5, from Growing Up in Scotland cohort study	Study assessed whether changes in objective and subjective family income predict changes in children's diets over time, using fixed effects models controlled for time-varying characteristics including maternal education, maternal social class, family composition and maternal employment.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
					Descriptive results: children in persistently high-income families were more likely to eat sweets less than once a day than children in persistently low income families (47.2% vs. 20.5%). Fixed effects models: mothers who transitioned from 'living very comfortably' towards 'finding it very difficult' had children who increased their consumption of sweets (OR=2.23, 95% CI 1.18 to 4.20) from ages 2 to 5 (but not sugary drinks). Change in objective income not related to changes in sugary food/drink consumption.
Watt et al. 2000 (73)	Intake of sugary drinks; % energy from NMES	Observational, cross-sectional	Parental social class	1,675 children aged 1.5 to 4.5 years, from 1993 National Diet and Nutrition Survey	Carbonated drinks more than once a day were consumed by 10.4% of children from manual backgrounds vs. 2.7% of children from non-manual. More children in non-manual group consumed fruit juice (48% vs. 26% in manual group.) No difference in overall NMES intake between the groups.

Table S1.4 Socio-economic position and service use

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Dental attendance					
Aldossary et al. 2015 (1)	Long-term pattern of dental attendance (always / current / former / never regular)	Observational, cross-sectional	Education; household income; social class (Registrar General)	3,235 dentate adults aged ≥16 years from 2009 ADHS	In unadjusted analysis, dental attendance patterns were associated with each SEP indicator. Never regular-attenders were on average less educated, had lower household income and were from lower social class than those in always-, current- and former-regular categories (all p<0.001). Education: among current regular attenders 21% had no qualifications and 18% had a degree, while among never regular attenders 45% had no qualifications and 8% had a degree. Income: among current regular attenders 17% were from poorest and 23% from richest households, while among never regular attenders 42% were from poorest and 9% were from richest.
Al-Haboubi et al. 2013 (74)	Dental attendance (time since last visit; satisfaction with care)	Observational, cross-sectional	Social grades based on chief income earner	695 adults aged ≥16 years residing in three South London Boroughs	In regression analysis adjusted for age, sex, ethnicity and borough, there were inequalities in dental care use by social grade. Those from the lowest social grades were 17% less likely to have visited the dentist in the last 2 years compared to those from the highest social grades (95%CI 0.72-0.96; p<0.05). Among participants who visited the dentist, satisfaction with care was not associated with social grade.
Alikutty & Bernabé 2016 (11)	Long-term pattern of dental attendance (current,	Observational, cross-sectional	Education; social class (Registrar General)	3,272 dentate adults aged ≥16 years from the 1998 ADHS	Descriptive results not adjusted for age and sex: both educational level and social class were associated with long-term patterns of dental attendance. Never regular-attenders were on average less educated and from a lower social class

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
	always, former and never regular)				than those in the always-, current- and former-regular groups (p<0.001). For example, among always regular attenders, 15% had no qualifications and 18% had a degree or above; while among never regular attenders, 42% had no qualifications and 8% had a degree or above.
Cheema and Sabbah 2016 (3)	Frequency of dental visits (regular vs. emergency only)	Observational, cross-sectional	Education; occupational classification (NS-SEC 3)	6,279 dentate adults aged ≥16 years from the 2009 ADHS	Descriptive results not adjusted for age and sex. Proportion of those attending for emergency dental visits only: By education: 26.1% among those with no qualifications; 22.3 among those with some qualifications and 19.3% among those with degree or above. By social class: 28.1% among routine and manual; 19.1% among intermediate; 17.8% among managerial / professional; and 59.6% among those who never worked.
Holmes et al. 2016 (75)	Dental attendance pattern (for check-ups; only when having trouble; never)	Observational, cross-sectional	Free school meal (FSM) eligibility	9,866 children (aged 5, 8, 12 and 15 years) from 2013 Child Dental Health Survey	Dental attendance by FSM reported for 12- and 15 year olds only (child self-report). 12 year olds: about 66% of FSM-eligible children reported visiting the dentist for a check-up compared to 86% of those not eligible. 15 year olds: about 74% of FSM-eligible children reported visiting the dentist for a check-up compared to about 85% of those not eligible.
Hullah et al 2008 (76)	Dental attendance (regular vs non-regular)	Observational cross-sectional	Social class (Registrar General)	Convenience sample of 206 postnatal women within 3	Around 83% of mothers from the lowest social class were non-regular attenders in comparison with approx. 33% of mothers from the highest social class. Around 67% of mothers from the

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
				days of delivery (mean age 28 years); from a North London Hospital	highest social class reported being regular attenders compared to approx. 17% of mothers from the lowest social group.
Labeit et al. 2013 (77)	Uptake of dental check-ups over period 1992-2008	Observational longitudinal	Transitory (current) household income; income between 1992 and 2008; education; employment	706 individuals (with 9,884 observations over time) aged 16+; from the British Household Panel Survey (1992 to 2008)	Random effects panel probit models adjusted for age, sex, previous check-ups, household income, education, employment, ethnicity, self-rated health, UK country, number of children, living with partner, smoking. Marginal effects reported.Transitory household income had no effect on uptake of dental check-ups. Higher permanent household income increased uptake (for 1% higher permanent income, uptake increased by 2.5%). Having secondary education increased uptake of dental check-up by 30.5% and tertiary education increased uptake by 28.3% compared to primary education.
Lang et al. 2008 (78)	Dental attendance (sympto-matic vs. unsympto-matic)	Observational, cross-sectional	Education; social class	4,240 dentate adults aged 65 or over from the 2005 Health Survey of England	Descriptive analyses showed social gradients by education and social class. In regression analysis adjusted for age, sex, region, urbanisation, area deprivation, self-reported health and smoking, both education and social class were independently associated with symptomatic dental attendance. Education: Compared to those leaving full-time education at age ≤14, those leaving at age ≥19 were less likely to attend only when symptomatic (RRR=0.49). Social class: those from unskilled manual occupations were significantly more likely to be symptomatic dental attenders compared to those with professional occupations (RRR=1.79).

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
McGrath 2001 (79)	Dental attendance within past year	Observational, cross-sectional	Education; income; social class (Registrar General); employment status	1,865 adults from 'omnibus survey' by the Office for National Statistic of Great Britain	Dental attendance was significantly associated with higher social class; higher level of income; more education and working part time (vs. full time). For example, 73% of those in the highest income band reported attendance within the past year compared to 59% in the lowest income group.
McGrath et al. 2002 (80)	Dental attendance pattern (regular vs. non-regular)	Observational, cross-sectional	Employment status; income; education	Subsample of 666 mothers with dependent children (<16 years) from two 'omnibus surveys' by the Office for National Statistic of Great Britain, 1999	Study assessed relationship between dental attendance and family structure. In adjusted regression analysis there were no statistically significant associations between any of the SEP variables and dental attendance patterns.
McGrath & Bedi 2002 (81)	Dental attendance (reason for dental visit)	Observational, cross-sectional	Education; social class based on occupation (Registrar General)	876 non-institutionalised older adults (aged ≥ 65) from "omnibus surveys" by the Office for	Assessed association between social support and oral health outcomes among older people in Britain. In logistic regression analysis neither social class nor education were significantly associated with being a pain motivated dental attender.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
				National Statistic of Great Britain, 1999	
Morris et al. 2006 (82)	Dental attendance pattern; treatments received	Observational, cross-sectional	Social class based on parental occupation (Registrar General and NS-SEC)	3,342 schoolchildren aged 5, 8, 12 and 15 years, from 2003 Children's Dental Health Survey	Social class differences greater among younger age groups. Proportion of 5 year olds who never visited a dentist: 13% among children from the lowest and 2% among children from the highest parental social classes. Also among 5 year olds, 39% of those from routine/manual social classes were symptomatic attenders vs. 25% of those from managerial/professional classes ($p<0.05$). Children from non-manual households were more likely to have visited but not had extractions or fillings, apart from 12 year olds where association was not clear. Comparison with previous surveys showed that proportion of children who had never visited the dentist markedly decreased between 1983 and 2003.
Pace-Balzan et al. 2014 (83)	Regular dental attendance (yes/no)	Observational, cross-sectional	Education	444 patients diagnosed with oropharyngeal cancer between 1998 and 2009, from University Hospital Aintree HNC database	Patients were surveyed in 2009 to 2010. 69% saw a dentist regularly. Those who left education at <16 years of age were less likely to be regular attenders.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Pau et al. 2007 (44)	Dental attendance (in last 12 months)	Observational, cross-sectional	Social class (non-manual vs. manual)	Subsample of 1,400 adults aged ≥16 years who reported dental pain, from 1998 ADHS	Results from logistic regression adjusted for age group and sex. Amongst individuals who reported dental pain in the last 12 months, those in manual occupations were significantly more likely to report that they had not visited the dentist within the last 12 months (OR=1.43), compared to those in non-manual occupations.
Sabates & Feinstein 2008 (84)	Uptake of dental health check-ups over period 1991 to 2003	Observational, longitudinal	Transitory income (monthly); permanent income (average over 13 years)	4,947 adults (<19 years) from British Household Panel Survey (from 1991 to 2003)	Results from dynamic random effect probit model adjusted for age, social class, education, employment, ethnicity, health measures, smoking, household size and NHS region. Study found permanent income effects on dental check-ups: for each % increase in permanent income, uptake of dental check-ups increased by 4.1%.
Singh et al. 2013 (60)	Dental attendance (only in trouble / never vs. other)	Observational, cross-sectional	Education (no qualifications, below degree level, degree level or above)	10,540 dentate adults (<16 years) from 2009 ADHS	Study explored social inequalities in clustering of oral health related behaviours. Descriptive analysis not adjusted for age and sex: Dental attendance only when in trouble / never associated with education, that is: no qualification= 38.23%, below degree= 29.15%; degree or higher= 23.20% (p<0.001).
Tchicaya & Lorentz 2014 (85)	Non-use of dental care	Observational, cross-sectional, cross-country survey in 24 European countries	Education (primary, secondary, tertiary)	17,484 UK adults aged ≥16 years from EU Statistics on Income and Living	Study calculated absolute and relative differences in the non-use of dental care by educational level (difference in prevalence, Relative Concentration Index (RCI) and Relative Index of Inequalities (RII)). RII results indicated that there was no difference in the non-use of dental care by levels of education for men and women in the UK.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
				Conditions 2007 survey	
Other outcomes related to service use					
Cheema and Sabbah 2016 (3)	Lifetime use of dental services (preventive / restorative / extractions)	Observational, cross-sectional	Education; occupational classification (NS-SEC 3)	6,279 dentate adults aged ≥16 years from the 2009 ADHS	In regression analysis adjusted for age, sex, UK country, frequency of dental visits, self-reported oral health, DMFT and ethnicity, participants with no qualifications were significantly less likely to ever receive preventive (OR=0.48) or restorative (OR= 0.56) services and more likely to receive extractions (OR=1.44) than those with a degree. Those in routine/manual occupations were significantly less likely to have received preventive (OR = 0.58) and more likely to have had extractions (OR = 1.26) than those in managerial/professional occupations.
Holmes et al. 2016 (75)	Access to NHS dental services; satisfaction with dental services	Observational, cross-sectional	Free school meal (FSM) eligibility	9,866 children (aged 5, 8, 12 and 15 years) from 2013 Child Dental Health Survey	A higher proportion of parents of FSM-eligible children reported difficulties finding an NHS dentist compared to parents of children not eligible (point estimates not reported). Results for 12 year olds only: 68% of parents of FSM-eligible 12 year olds were satisfied with the wait for an urgent appointment compared to 84% of the non-eligible group.
Macfarlane et al. 2003 (86)	Health care seeking behaviour for orofacial pain (OFP)	Observational, cross-sectional	Education	555 adults with OFP, aged 18-64 from a GP practice in Cheshire, England	No association between healthcare seeking behaviour and education.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
McGrath & Bedi 2002 (87)	Less than 20 teeth without recourse to a denture	Observational, cross-sectional	Income; social class based on occupation (Registrar General)	1,855 adults aged 16+ years (ONS survey, 1999)	Only 6% of the sample had less than 20 teeth without recourse to a denture. In regression analysis, those from lower social classes were almost 50% less likely to use a removable dental prosthesis despite having less than 20 teeth compared with individuals from higher social classes (OR=0.53) after controlling for age, sex, income, type of service used and difficulty in obtaining a NHS dentist. No independent association with income.
Patel et al. 2006 (88)	Dental examination (ever; recent = in previous 21 months)	Observational, cross-sectional	Social class (Registrar General)	3,652 women aged 62 to 83 years from the British Women's Heart and Health Study	Age adjusted logistic regression models: compared to non-manual, women from manual occupations were less likely to report ever having had a dental examination (OR=0.38) and less likely to have had a recent dental examination (OR=0.42). For the latter, association remained significant (OR=0.44) after accounting for age, smoking, physical activity, locomotor disability and present health. Clear social gradient in fully adjusted logistic regression also when 6-category social class was used (p<0.001).
Telford et al. 2012 (89)	Use of publicly funded dental care	Observational, longitudinal	Parental social class (NS-SEC); parental education	12,846 adolescents aged 11 to 12 years in 2003; from Northern Ireland Longitudinal Study	Utilisation of dental care assessed from 2003 to 2008. Regression models mutually adjusted for social class, education, sex, parental marital status and number of siblings. Provision of orthodontic treatments was highly concentrated among those from higher social classes and with higher education level; while all restorative treatments and extractions were more concentrated among lower socio- economic groups.

Author and year	Outcomes	Study design	Measure of SEP	Study population	Key findings
Telford & O'Neill 2012 (90)	Dental registration (in months)	Observational, longitudinal	Parental social class (NS-SEC); parental education	13,564 adolescents aged 11 to 12 years in 2003; from Northern Ireland Longitudinal Study	Outcome was average number of months registered with a GDP in 2003 to 2004 and 2007 to 2008. Regression models mutually adjusted for social class, education, sex, family type and number of siblings. On average, adolescents from lower socioeconomic backgrounds were registered with the GDP for a significantly shorter amount of time than adolescents from highest socioeconomic groups (difference in means) at both time points.

Table S2.1 Area deprivation and clinical outcomes (dental caries, odontogenic infections, periodontal disease, tooth loss, dental trauma, oral cancer)

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Dental caries					
Al-Haboubi et al. 2014 (91)	DMFS	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2007	186 dentate adults, aged 60 years and over, recruited from primary dental care clinics associated with King's College London Dental Institute	Unadjusted comparison between those living in the most deprived areas (n=47) with those in the least deprived (n=47): no statistically significant difference in mean DMFS, but individuals from the most deprived areas had significantly more missing surfaces (61.1 vs. 40.5) and fewer filled surfaces (23.7 vs. 45.0). In regression models controlled for age, sex, and ethnicity, differences in missing and filled surfaces remained statistically significant.
Blair et al. 2013 (92)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, data from 8 cross-sectional surveys	Carstairs Index (7 categories)	68,398 five year old children examined in Scotland's National Dental Inspection Programme (NDIP) in years: 1994, 1996, 1998, 2000, 2003, 2004, 2006, and 2008	Study calculated absolute and relative differences between most and least deprived groups, Slope Index of Inequality (SII) and Relative Index of Inequality (RII). In 1993/94, children in the most deprived areas in Scotland were 7.5 times more likely to have d3mft > 0 (odds ratio) compared to least deprived; while in 2007/08 the odds ratio was 4.9. Absolute inequalities in mean d3mft reduced over study period: SII was about 3.2 in 1993/94 and about 2.3 in 2007/08 (estimates from figure). Relative inequality (RII) increased marginally towards end of study period.

Blair et al. 2015 (93)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, data from 10 cross-sectional surveys	Carstairs Index (7 categories)	92,564 five year old children examined in Scotland's National Dental Inspection Programme (NDIP) in years: 1994, 1996, 1998, 2000, 2003, 2004, 2006, 2008, 2010, and 2012	Study examined caries levels in Glasgow vs. the rest of Scotland. Absolute inequalities in mean d3mft slightly reduced over study period (but not in % with d3mft > 0). In Glasgow in 1994, mean d3mft was 5.2 for the most and 2.6 for the least deprived areas; this reduced in 2012 to 2.6 in the most and 0.3 in the least deprived. For rest of Scotland in 1994: mean d3mft = 4.5 in most and 2.8 in least deprived; in 2012 1.2 in most and 0.5 in least deprived. Percentage with d3mft > 0: in Glasgow in 1994 = 82% among most and 47% among least deprived; in 2012, 50% among most and 11% among least deprived; rest of Scotland in 1994 = 70% among most and 34% among least deprived; in 2012, 56% among most and 19% among least deprived.
Bower et al. 2007 (12)	Number of sound/ restored teeth; presence of untreated caries	Observational, cross-sectional	Carstairs Index (7 categories)	632 dentate Scottish participants living in 346 households in 31 postcode sectors in Scotland, from 1998 ADHS	Number of sound teeth: in unadjusted analyses, mean number of sound teeth significantly higher in those from least deprived areas (23.2 in least deprived vs. 17.3 in most deprived areas); association no longer statistically significant after adjustment for age, sex, social class, income and education. Presence of unsound teeth: no significant associations in unadjusted or adjusted analyses.
Broomhead et al. 2014 (94)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2010	3,896 5 year olds, from 117 state schools in Sheffield, England; from NHS Dental	In unadjusted regression analysis, the IMD total score explained 60.4% of the variance in dental caries. Greater IMD scores (higher level of deprivation) were associated with higher levels of dental caries.

				Epidemiological Programme	
Conway et al. 2007 (95)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, cross-sectional	Carstairs Index (7 categories)	649 five year olds from multi-ethnic schools in Greater Glasgow, surveyed in 2001 to 2002	In DepCat 1/2 (least deprived), mean d3mft was 1.5 among White children, vs. 4.6 among Pakistani children. In DepCat 6/7 (most deprived), mean d3mft was 2.6 among White children, vs. 4.0 among Pakistani children. Area deprivation was not independently associated with d3mft in general linear model adjusted for ethnic group (White / Pakistani). No interaction between ethnicity and area deprivation.
Dugmore and Nunn, 2004 (96)	D3MFT index (decayed into dentine)	Observational, cross-sectional	Townsend Index (quintiles)	1,753 children aged 12 years, from BASCD Leicestershire population sample	Study compared caries prevalence of Community Dental Service (CDS) patients in Leicestershire with BASCD population, results by area deprivation only reported for BASCD sample. Mean DMFT was 0.84 among the least deprived and 1.30 among the most deprived children; mean number of decayed teeth was 0.47 among the least and 0.77 among the most deprived; percentage with untreated decay was 27% among least and 38% among most deprived; percentage with DMFT>0 was 39% among the least deprived and 51% among those from most deprived areas.
Dugmore and Rock, 2005 (97)	D3MFT index (decayed into dentine)	Observational, cross-sectional	Townsend Index (high, average, low deprivation)	Random sample of 1,753 12 year old children (20% of children from all 62 secondary schools in	Mean DMFT was significantly ($p<0.01$) higher in the high deprivation group (DMFT=1.21) compared to average (DMFT=1.12) and low (DMFT=0.89) deprivation groups. Significantly lower proportions of children from less deprived areas had active decay (27% in low vs. 37% in average and 36% in high

				Leicestershire and Rutland, England)	deprivation group) and past caries experience (39% in low vs. 48% in average and 47% in high deprivation group).
Ellwood et al. 2004 (98)	dmft; upper primary incisor caries; teeth extracted due to caries	Randomised controlled trial	Townsend Index (quartiles)	3,467 children followed from age 12 months to age 5 years; from 9 health districts in North-West of England	Study tested effectiveness of providing free toothpaste with either 1450 or 440 ppm Fluoride on caries experience at different levels of deprivation. Similar absolute reductions in mean dmft among the most and least deprived groups for those using high-concentration F toothpaste. For those in least deprived areas, no difference between low-concentration F toothpaste and control group; while for children in most deprived areas similar benefit from low- and high-concentration toothpastes. Programme did not reduce deprivation-related health inequalities.
Foster et al. 2009 (99)	dmft; DMFT	Observational, cross-sectional	Index of Multiple Deprivation (IMD)	Over 150,000 5 year olds and around 100,000 11 year olds; England; data from BASCD surveys 2003 to 2004 and 2004 to 2005	Study estimated difference in mean dmft between fluoridated / non fluoridated areas at different levels of IMD. Overall, mean dmft and DMFT increased with increasing IMD scores. Difference between fluoridated and non-fluoridated areas (i.e. benefit from fluoridation) was higher at higher levels of deprivation.
Jones 2000 (100)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, cross-sectional	Jarman Under Privileged Area score	10,004 five year old children from state primary schools in 3 areas in North and North West of England; data from BASCD surveys 1991	3 areas were: naturally fluoridated Hartlepool (mean dmft = 0.73), fluoridated Newcastle & North Tyneside (mean dmft = 1.34) and non-fluoridated Salford & Trafford (mean dmft = 2.36). Mean dmft was associated with Jarman scores in all 3 areas, but association was significantly less strong in the fluoridated areas (flatter regression lines) than in the

				to 1992 and 1993 to 1994	non-fluoridated area. Difference between fluoridated and non-fluoridated areas was higher at higher levels of deprivation, suggesting that "fluoridation ameliorates the effect of social deprivation on tooth decay in 5 year old children."
Jones and Worthington 2000 (101)	DMFT	Observational, cross-sectional	Townsend Index	6,638 children aged 12 years from non-fluoridated wards in Liverpool (< 0.1 mgF/l), fluoridated wards in Newcastle (1 mgF/l); data from BASCD surveys 1992 to 1993	Area deprivation scores and tooth decay were significantly correlated in areas with and without water fluoridation, but the association was stronger (steeper regression line) in non-fluoridated Liverpool than in fluoridated Newcastle. Statistically significant interaction between ward Townsend score, mean DMFT and water fluoridation: benefits of fluoridation were greater in more deprived areas.
Levin et al. 2009 (102)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, data from 6 cross-sectional surveys	Carstairs Index (7 categories)	Children aged 5 years, from Scottish Health Boards' Dental Epide-miological Programme and National Dental Inspection Programme (6 surveys in 1993, 1995, 1997, 1999, 2002, 2003), N from 5,656 to 9,858	In 1993, the odds of a child in deprivation category 7 (most deprived) having any d3mft were 7.49 (5.03–11.15) that of a child in category 1 (most affluent). In 2003, the odds of a child in the most deprived areas of having d3mft were 4.60 (3.47–6.14) that of a child in the least deprived areas. For those with any d3mft, inequalities in the amount of d3mft did not decrease over time: RR of an additional d3mft for those in DepCat 7 was 1.53 that of DepCat 1 in 1993, and 1.69 that of DepCat 1 in 2003. Results age and sex-adjusted.

Levin et al. 2009 (103)	D3MFT index (decayed into dentine)	Observational, cross-sectional	Carstairs Index (7 categories)	Random sample of 1,333 schoolchildren aged 11 years; Scottish National Dental Inspection Programme; about half the sample part of school-based fluoride-rinsing programme	Percentage caries-free among fluoride rinsers in least deprived areas (DepCat 1) = 81% vs 31% in DepCat 7 (most deprived) and 53% in DepCat 6. Among non-rinsers, 59% in DepCat 1 were caries free vs. 33% in DepCat 7. Mean D3MFT among rinsers = 0.33 in DepCat 1 vs. 2.16 in DepCat 7; among non-rinsers 0.83 in DepCat 1 vs. 2.47 in DepCat 7. In logistic regression adjusted for age, sex and fluoride rinsing, children in DepCat7 were 3.1 times more likely to have D3MFT >0 than children in Depcat1.
Levin et al. 2010 (104)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, cross-sectional	Scottish Index of Multiple Deprivation (SIMD) 2006	11,417 primary school children aged 5 years; Scottish National Dental Inspection Programme	Study examined urban-rural differences in dental caries. Prevalence of and number of d3mft were greater in more urban areas and greatest in the 4 Cities (Glasgow, Edinburgh, Dundee and Aberdeen). Adjusting for area deprivation partly explained the differences. Deprivation was associated with mean d3mft and all of its components, adjusted for age, sex and rurality. Children living in more deprived areas were less likely to have carious teeth restored.
McGrady et al. 2012 (105)	ICDAS criteria: D1-6MFT (white spot lesion or worse); D4-6MFT (decayed into dentine)	Observational, cross-sectional	Index of Multiple Deprivation (IMD)	1,783 children aged 11 to 13 (910 from fluoridated Newcastle, 873 from non-fluoridated Manchester); examined 2008 to 2009	Social gradients by area deprivation in mean D4-6MFT apparent in both cities but steeper in non-fluoridated Manchester. In Newcastle, mean D1-6MFT scores were 1.89 for least deprived and 3.80 in most deprived quintile; D4-6MFT scores were 0.38 in least and 0.99 in most deprived quintile. % caries-free (caries into dentine) 78% in least and 56% in most deprived. In Manchester, mean D1-6MFT scores were 2.54 for least deprived and 5.76 in most deprived quintile; D4-

					6MFT scores were 0.45 in least and 1.52 in most deprived quintile. % caries-free (caries into dentine) 72% in least and 39% in most deprived.
McMahon et al. 2010 (106)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, cross-sectional	Scottish Index of Multiple Deprivation (SIMD) quintiles	Nursery attending children aged 3 to 4 years in Greater Glasgow in 2006/7 (n = 1,711) and 2007/8 (n=2,428); Scottish National Dental Inspection Programme	Mean d3mft was 1.1 in 2006/7 and 1.0 in 2007/8. Unadjusted analyses for 2006/7: in least deprived quintile mean d3mft = 0.3 and % caries-free = 87%; in most deprived mean d3mft = 1.5 and % caries-free = 67%. Unadjusted analyses for 2007/8: in least deprived quintile mean d3mft = 0.5 and % caries-free = 84%; in most deprived mean d3mft = 1.4 and % caries-free = 68%. Logistic regression adjusted for age and survey year: children in the most deprived areas were 2.9 times more likely to have any caries experience (d3mft>0) than those in the least deprived.
McMahon et al. 2011 (107)	d3mft (decayed into dentine, missing and filled primary teeth)	Observational, 4 cross-sectional surveys	Scottish Index of Multiple Deprivation (SIMD) quintiles	Altogether 10,022 nursery attending children aged 3 to 4 years in Greater Glasgow and Clyde in 2006 to 2007; 2007 to 2008; 2008 to 2009 and 2009 to 2010; Scottish National Dental Inspection Programme	Study examined extent of improvements in dental health during the initial years of the Childsmile programme. Weighted mean d3mft was 1.1 in 2006/7, 1.0 in 2007/8, 0.6 in 2008/9, and 0.4 in 2009 to 2010. Social inequalities by area deprivation narrowed over the study period. In 2006/7, proportion with obvious decay was 33% and mean d3mft was 1.5 among children from most deprived vs. 13% and 0.3 among those from least deprived areas. In 2009 to 2010, proportion with obvious decay was 24% and mean d3mft was 0.5 in most deprived vs. 5% and 0.1 in least deprived areas.

Milsom et al. 2014 (108)	dmft	Observational, 5 cross-sectional surveys	Index of Multiple Deprivation (IMD), tertiles	5 year old children living in Halton and St Helens, England; data from 5 surveys in 2007 to 2008, 2008 to 2009, 2009 to 2010, 2010 to 2011 and 2011 to 2012. n for each survey between 1500-1700	Study measured dental health of children with different length of exposure to a population dental prevention programme (introduced in 2008). Data collected using BASCD survey criteria. Social gradient in each survey – proportion of children with no active decay highest in least deprived and lowest in most deprived areas. Improvements across survey years were slightly greater for most deprived areas. In 2007 to 2008, 57.4% of children in most deprived IMD tertile had no active decay vs. 81.3% in least deprived. In 2011 to 2012, 61.7% of children in most deprived areas had no active decay vs. 84.9% in least deprived.
Muirhead and Marcenes 2004 (109)	dmft	Observational, cross-sectional	Jarman Under Privileged Area score	1968 5 year old children from 55 Wandsworth state primary schools; England; data from BASCD survey 2001 to 2002	School mean dmft was associated with school address Jarman scores (p= 0.02) in unadjusted linear regression model. School address Jarman scores explained 9.5% of the variation in school mean dmft.
Nuttall 2001 (21)	Mean number of decayed or unsound teeth; mean number of filled teeth	Observational, cross-sectional	Carstairs Index (7 categories)	650 dentate Scottish adults from 1998 ADHS	Data suggest social gradients (gradients not entirely linear). Those in the most deprived areas (DECAT 6 and 7) had on average 1.9 decayed or unsound teeth and 5.6 filled teeth, while those in the least deprived areas (DEPCAT 1) had on average 1.1 decayed or unsound teeth and 9.3 filled teeth.

Radford et al. 2000 (110)	Isolation frequency of caries-associated micro-organisms	Observational, cross-sectional	Carstairs Index (7 categories)	1393 1 year old infants = 70.3% of children born in Dundee during one year period in 1993 to 1994	Study examined associations between area deprivation and isolation frequency of Strep. mutans, Strep. sobrinus, lactobacilli and yeasts. Infants living in areas of high deprivation had significantly higher caries prevalence compared to those from more affluent areas (DEPCAT 6 and 7 = 3.6% vs. DEPCAT 1–5 = 1.9%). The proportion of infants harbouring yeasts was highest in most deprived areas (DEPCAT 6 and 7). Area deprivation was not significantly associated with isolation frequencies of any of the other caries-associated micro-organisms.
Radford et al. 2001 (111)	Isolation frequency of caries-associated micro-organisms	Observational, longitudinal	Carstairs Index (7 categories)	Cohort of children born in Dundee during one year period in 1993 to 1994 and examined annually from 1 to 4 years of age (n = 1,099–1,392)	Study examined associations between area deprivation and isolation frequency of Strep. mutans, Strep. sobrinus, lactobacilli and yeasts. No clear picture emerged. In unadjusted analyses, isolation frequency of S. mutans increased with increasing area deprivation at ages 2, 3 and 4; when controlling for caries correlations were only found at age 2 (d1 level) and age 3 (d3 level). Yeasts were associated with deprivation at ages 1 and 2 but not thereafter, when controlling for caries. Lactobacilli were associated with deprivation only at ages 3 and 4 years, when controlling for caries.
Steele et al. 2015 (7)	Presence of decay; any teeth unrestorable due to decay; DMFT	Observational, cross-sectional	Index of Multiple Deprivation (IMD) quintiles	5,067 dentate adults aged ≥21, from 2009 ADHS	Multiple regression models adjusted for income, education, social class and IMD simultaneously, and additionally for age, sex, marital status, region, long-standing illness, and self-assessed health. IMD was independently associated with presence of decay and presence of unrestorable teeth but not DMFT.

					Probability of having any untreated decay was 8% higher among those in the most deprived compared to the least deprived areas (p<0.001). Presence of any unrestorable teeth was 5% higher among those in the most deprived compared to the least deprived areas (p<0.001). Both associations were stronger among younger age groups.
Stephenson et al. 2009 (112)	Caries in primary teeth at d1 level; surface survival before caries occurring	Observational, longitudinal	Townsend Index, categorised into low, median and high deprivation	2,654 children aged 4 to 5 years at baseline, re-examined at ages 5 to 7, 7 to 9 and 9 to 11 years; recruited in 1999 in West Midlands and South Wales	Study estimated survival time of primary tooth surfaces in relation to occurrence of caries, taking exfoliation risk into account as 'competing risk' as well as clustering of surfaces within children. Results from multilevel parametric survival models: Median surface survival time to caries was 10.7 years in children from most deprived areas compared to 11.2 years in least deprived. Approximate (extrapolated) odds ratios for a surface becoming carious by age 14 years were 0.82 for least deprived and 1.26 for most deprived (reference: median deprivation).
Tickle et al. 2000 (113)	dmft	Observational, cross-sectional	Several indicators (Jarman, Townsend, market penetration and others)	All 5 year old children examined during the 1995/96 NHS epidemiological survey, in seven districts in the North West Region of England (total N=15,747)	Study compared different area deprivation indicators. Consistent social gradients in caries prevalence, irrespective of the area deprivation indicator used. Large differences in prevalence (dmft>0 and dmft>5) found between deprived and affluent areas.

Tickle, Kay, Worthington and Blinkhorn 2000 (114)	dmft	Observational, cross-sectional	Jarman Under Privileged Area score; Townsend Index; Census variables	About 24,000 5 year old children from 30 districts of the North West Region of England, from 1995 to 1996 NHS dental survey	Study tested whether Census data combined with health service data stored by health authorities predict population dental disease experience at the small area level. Strong associations between all commonly used measures of deprivation and mean dmft at small area level. Jarman scores explained 45% and Townsend index explained 43% of the variability of ward dmft. Health services data did not improve on ability of deprivation-related Census variables to predict population caries levels.
Tickle, Moulding, Milsom and Blinkhorn 2000 (115)	dmft	Observational, cross-sectional	Jarman Under Privileged Area score	862 5 year old children attending state school in Ellesmere Port in the North West of England; examined in 1997 to 1998 NHS epidemiological survey	Significant linear relationship between dmft and Jarman score (p=0.02). Higher dmft in more deprived areas. Jarman scores explained 43% of the variability of dmft.
Tickle et al. 2002 (116)	Number of carious teeth; number of filled carious teeth	Observational, longitudinal	Townsend Index	658 children who were born in 1984 to 1985 and regularly attending 50 GDPs in the North West of England (data from case notes 1990 to 1999)	No significant association between area deprivation and the total number of teeth affected by caries; or percentage of carious teeth that were filled.

Odontogenic infections					
Bakathir et al. 2009 (117)	Spreading odontogenic infections (SOI)	Observational, cross-sectional; pilot study	Carstairs Index (7 categories)	25 patients aged 8 to 57 years, presenting with severe SOI in the West of Scotland Oral & Maxillo-facial Service Centres, from February to July 2003	Most common source of infection was carious teeth and roots (88% of cases). Thirteen patients (52%) were from the most deprived areas (DEPCAT 7); and a further 10 (40%) in categories 5 and 6.
Byers et al. 2012 (118)	Acute cervico-facial infection	Observational, cross-sectional	Scottish Index of Multiple Deprivation 2009	103 patients aged 5-87 years, clinical audit data from 2010, from 14 oral surgery or maxillofacial surgery units in Scotland	Disproportionate number of patients came from more deprived areas. 37 (36%) were from the most deprived quintile, 19 from the second most deprived, 16 each from the 3rd and 4th quintile and 15 from the least deprived.
Pine et al. 2006 (119)	Dental sepsis ('dental abscesses')	Observational, cross-sectional	Carstairs Index (7 categories)	6,994 children (mean age 5.3 years) from 1999 to 2000 Scottish Health Board Dental Epidemiological Programme	4.8% of examined children had dental sepsis, ranging from 2% in the most affluent areas to 11% in the most deprived. Children in DEPCAT categories 5 to 7 (most deprived) were 1.40 times more likely to present with dental sepsis than those in categories 1 to 4 (less deprived), after adjustment for numbers of decayed, filled and extracted teeth, and presence of plaque.
Periodontal disease					
Al-Haboubi et al. 2014 (91)	Plaque Index and Gingival Index	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2007	186 dentate adults, aged 60 years and over, recruited from primary dental care clinics associated with	Unadjusted comparison between those living in the most deprived areas (n=47) with those in the least deprived (n=47): individuals from the most deprived areas had significantly greater Plaque Index scores, but there was no difference in Gingival Index. In

				King's College London Dental Institute	regression models controlled for age, sex, and ethnicity, differences in Plaque Index were not statistically significant.
Bower et al. 2007 (12)	Presence of periodontal pockets of ≥4mm	Observational, cross-sectional	Carstairs Index (7 categories)	632 dentate Scottish participants living in 346 households in 31 postcode sectors in Scotland, from 1998 ADHS	In unadjusted analyses, no association between presence of periodontal pockets and area deprivation. Also no significant associations in multilevel models, and adjusting for area deprivation did not help to explain variation in the prevalence of periodontal pocketing between areas.
Steele et al. 2015 (7)	Presence of periodontal pockets of ≥6mm	Observational, cross-sectional	Index of Multiple Deprivation (IMD) quintiles	5,067 dentate adults aged ≥21, from 2009 ADHS	Multiple regression models adjusted for income, education, social class and IMD simultaneously, and additionally for age, sex, marital status, region, long-standing illness, and self-assessed health. IMD was independently associated with pocketing of ≥6mm. Probability of having any pockets of ≥6mm was 6% higher among those in the most deprived compared to the least deprived areas (p<0.001).
Tooth loss					
Al-Haboubi et al. 2014 (91)	Number of natural teeth	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2007	186 dentate adults, aged 60 years and over, recruited from primary dental care clinics associated with King's College London Dental Institute	Unadjusted comparison between those living in the most deprived areas (n=47) with those in the least deprived (n=47): individuals from the least deprived areas had significantly more natural teeth than those from the most deprived (23.8 vs. 19.1; p <0.001). Results from regression models not shown.

Jagger et al. 2013 (19)	Edentulism (total tooth loss)	Observational, cross-sectional	Carstairs Index (quintiles)	Scottish adults aged 45 years and over, from Scottish Health Surveys (SHeS) (1995; 1998; 2003; 2008 to 2009)	Calculated absolute and relative differences between most and least deprived groups, Slope Index of Inequality (SII) and Relative Index of Inequality (RII). Across all survey years, prevalence of edentulism was highest for the most deprived and lowest for the least deprived groups. Higher absolute inequality for older age groups; downward trend in absolute inequality over time but only for those under 65 years. Relative inequality higher in younger age groups; relative inequality by Carstairs quintile slightly increased over time but increase not statistically significant.
Nuttall 2001 (21)	Mean number of teeth; edentulism (total tooth loss)	Observational, cross-sectional	Carstairs Index (7 categories)	1,171 Scottish adults from 1998 ADHS	Data suggest social gradients (gradients not entirely linear). Those in the most deprived areas (DECAT 6 and 7) had on average 21.3 teeth, and among them 25% were edentulous. Those in the least deprived areas (DEPCAT 1) had on average 24.7 teeth and among them 14% were edentulous.
Starr et al. 2008 (27)	Edentulism (total tooth loss)	Observational, cross-sectional	Carstairs Index	201 healthy participants aged 70 and over, waves 1 and 4 of Healthy Old People in Edinburgh (HOPE) study	51.7% of the sample were edentulous. In logistic regression adjusted for age, sex, education, social class, area deprivation via Carstairs index, objective distance from dentist, participant's estimate of distance from dentist and cognitive ability, area deprivation was not independently associated with being edentulous at wave 1. Unadjusted data not shown.

Steele et al. 2015 (7)	Presence of 3+ unfilled upper spaces; number of natural teeth	Observational, cross-sectional	Index of Multiple Deprivation (IMD) quintiles	5,404 dentate and edentate adults aged ≥21, from 2009 ADHS	Multiple regression models adjusted for income, education, social class and IMD simultaneously, and additionally for age, sex, marital status, region, long-standing illness, and self-assessed health. IMD was independently associated with having 3+ unfilled upper spaces and number of natural teeth. Probability of having 3+ unfilled upper spaces was 3% higher among those in the most deprived compared to the least deprived areas (p<0.001). Those in the most deprived areas had on average 1.13 fewer natural teeth compared to those in least deprived areas (p<0.001). Clear social gradient with number of natural teeth decreasing as deprivation increases.
Dental trauma					
Blokland et al. 2016 (33)	Trauma to permanent incisors (yes / no), including treated and untreated; severe trauma	Observational, cross-sectional	Index of Multiple Deprivation (IMD)	6,707 school-children aged 8, 12 and 15, from 2013 Child Dental Health Survey	In multiple logistic regression models, no association between IMD and experience of dental trauma, before or after adjustment for age and sex. Also no association between IMD and severe dental trauma.
Marcenes and Murray 2001 (120)	Trauma to permanent incisors	Observational, cross-sectional	Jarman Index	2,105 schoolchildren aged 14 years in Newham, London with valid postcode data, examined in 1995 to 1996	Prevalence of traumatic dental injuries in Newham (24%) was higher than the overall prevalence in the UK (17%) and in England (15%). However, no association between overall Jarman Index and experience of dental trauma. Only one individual component of the index, overcrowded households,

					was significantly related to the presence of dental injuries (p< 0.05). Adjusted for sex.
Marcenes and Murray 2002 (121)	Traumatic Dental Injuries to permanent incisors	Observational, cross-sectional	Jarman Index	411 14 year old schoolchildren in Newham in 1998 to 1999	No association between overall Jarman Index and experience of dental trauma. Only two individual components of the index, overcrowded households and ethnicity, were significantly related to the presence of dental injuries (p< 0.05) after adjusting for sex.
Rhouma et al. 2013 (122)	Annual incidences of traumatic dental injuries (TDI) to primary incisors	Observational, annual cross-sectional surveys	Carstairs Index (DEPCAT)	Scottish Health Boards' Dental Epidemiological Programme and National Dental Inspection Programme (NDIP) records for 68,354 5 year old children, 1993 to 2007	Of all examined children, dental injury was recorded for only 405 (0.6%); overall incidence = 5.9/1000 population. Incidence decreased over time. No significant association between risk of dental injury and level of area deprivation.
Oral cancer					
Abel et al. 2015 (123)	Oral, oro-pharyngeal and laryngeal cancer; diagnosis through emergency presentation	Analysis of cancer registry data	Index of Multiple Deprivation (IMD), income domain only	749,645 patients (2006 to 2010) with any of 27 cancers; data from National Cancer Data repository for England and 'Routes to Diagnosis project'	Background: Diagnosis of cancer through emergency presentation is associated with poorer survival. Patients living in most deprived areas were at greater risk of emergency presentation in 24 out of 27 cancers. Excess risk of emergency presentation among more deprived patients was particularly high for oral, oropharyngeal and laryngeal cancers (OR

					most vs least deprived = 3.82 for oral cancer; OR = 2.18 for laryngeal cancer).
Anandan et al. 2007 (124)	5-year survival after diagnosis of naso-pharyngeal cancer	Analysis of cancer registry data	Carstairs Index	556 patients diagnosed with nasopharyngeal cancer in Scotland between 1975 and 2001; data from Scottish Cancer Registry	Relative survival (adjusted for 'background mortality' = expected survival if all had the same age- and sex-specific mortality in each period) was significantly higher in the most affluent group (Carstairs deprivation quintile 1: Hazard Ratio = 0.57; reference not clear). Adjusted for age at diagnosis, histological verification status, period of diagnosis and anatomical subsite.
Brocklehurst et al. 2012 (125)	Professional delay in head and neck cancer referrals	Analysis of hospital audit data	Index of Multiple Deprivation (IMD)	6,681 patients referred between 2004 and 2006; Mersey region, England	Professional delay = date of referral by a primary care clinician to date first seen by a secondary care clinician. 74% of patients were referred within 14 days. Most important factor for delay was the receiving hospital. Social gradient with longer delays for patients living in more deprived areas: in most deprived areas, 67% were referred within 14 days, vs. 85% in least deprived areas.
Conway et al. 2007 (126)	Incidence of oral and oro-pharyngeal cancer	Analysis of cancer registry data	Carstairs Index	10,857 patients diagnosed with oral and oro-pharyngeal cancer between 1976 to 2002; data from Scottish Cancer Registry and population data from General Register Office for Scotland	Age-standardised incidence rates by sex calculated. Widening gaps in oral cancer incidence between 1976 and 2002. For men, "gap between the most and least deprived appeared in the late 1970s and increased rapidly through to the 1990s... almost entirely explained by an increase in incidence in the most deprived group (+196%)". For women, also greatest increase in incidence among the most deprived (+163%), gap appeared in the 1980s.

Conway et al. 2010 (35)	Head and neck cancer	Population-based case-control study	Scottish Index of Multiple Deprivation (IMD) and Carstairs-2001 deprivation scores	103 patients (aged 24 to 80 years) diagnosed with head and neck cancer between 2002 and 2004, and 91 controls randomly selected from general practitioners' lists	Both IMD and Carstairs Index were associated with head and neck cancer. Cancer risk was highest in the most deprived areas. Unadjusted odds ratios for most deprived quintiles vs. least deprived: for IMD = 3.62 and for Carstairs Index = 4.66. Associations no longer statistically significant after adjustment for age, sex, smoking and alcohol consumption.
Ellis et al. 2012 (127)	Survival after diagnosis of laryngeal cancer	Analysis of cancer registry data	Index of Multiple Deprivation (IMD)	29,420 patients diagnosed with laryngeal cancer in 1991 to 2006 in England and Wales; National Cancer Registry data	Probability of relative survival (adjusted for 'background mortality' = expected survival if all had the same age- and sex-specific mortality) for all subsites combined: for women, no statistically significant deprivation gap for either 1-year or 5-year survival. For men, significant gaps: probability of 1-year survival 7%, and 5-year survival 13% lower among most deprived vs. least deprived quintiles.
Greenwood et al. 2003 (37)	Oral cancer	Case–control study	Carstairs Index	100 patients aged 34 to 95 years and diagnosed with oral cancer at Newcastle General Hospital between 1998 and 2000, and 100 controls matched for age and sex from dental hospital	Cases were significantly more likely to live in areas with higher deprivation scores than controls (p=0.002).

Lim et al. 2015 (128)	Size of periocular basal cell carcinoma at presentation	Analysis of hospital data	Scottish Index of Multiple Deprivation	67 cancer patients (mean age 72 years) diagnosed with periocular cancer at South Glasgow Hospitals NHS Trust, 1999 to 2009	Of 67 identified cases, 38 presented with small-size lesions, 24 with medium-size lesions, and 5 with large-size lesions. Pairwise comparisons between the 3 groups (Mann–Whitney tests) showed that median IMD score was significantly higher (= less deprived) in the small-size category compared to the medium-size category. No differences between large-size and other categories.
Moles et al. 2008 (129)	Incidence of oral and pharyngeal cancers	Analysis of cancer registry data	Carstairs Index	6,355 patients diagnosed with oral and pharyngeal cancer in South East England in 1985 to 1995, from Thames Cancer Registry	Social gradients among non-South Asian males: risk for both oral and pharyngeal cancers more than twice as high for those in most deprived areas compared to least deprived quintile. Social gradient also in pharyngeal cancer but not in oral cancer among non-South Asian females. No social gradients for either cancer among South Asian males or females.
Paterson et al. 2002 (130)	Survival after diagnosis of head and neck cancer	Analysis of cancer registry data (survival analysis)	Carstairs Index	20,131 patients from 4 regional cancer registries (West Midlands, Trent, Wales, East Anglia) for period 1981 to 1994	Of all cases, 74% of males and 73% of females were in the three most deprived Carstairs quintiles. Probability of relative survival (adjusted for 'background mortality' = corrected for age, sex and social class differences in mortality): absolute difference in 5-year survival between the most and least deprived quintiles varied (but not significantly) between 6 and 10% over 3 time periods (1981 to 1985, 1986 to 1990, 1991 to 1994). But, no significant differences in survival between the deprivation groups for those who were still alive beyond 18 months.

Purkayastha et al. 2016 (131)	Incidence trends for oral cavity, oropharyngeal and laryngeal cancer	Analysis of cancer registry data	Carstairs Index; also Scottish Index of Multiple Deprivation for 2000-2012	28,217 patients diagnosed between 1975 and 2012; mean age 64 years; from Scottish Cancer Registry	Age-standardized incidence rates and projected rates up to 2025 were calculated. Overall, cancer rates increased with increasing levels of deprivation (for both Carstairs and IMD). Over the past decade, social inequalities widened for oropharyngeal and laryngeal cancer. For all head and neck cancers, those in the most deprived decile had a 2.59 times higher risk compared to the least deprived (Carstairs Index 1991). Inequalities were most pronounced for laryngeal cancers. Incidence projections up to 2025 showed an expected rapid increase in the rates of oropharyngeal cancer.
Robertson et al. 2010 (132)	Survival after diagnosis of head and neck cancer	Observational, longitudinal (survival analysis)	Carstairs Index (DEPCAT scores): 1–2 = affluent; 3–5 = intermediate; 6–7 = deprived	1,909 patients diagnosed with head and neck cancer between 1999 and 2001; mean age 64 years; data from the Scottish Head and Neck Audit; General Register Office for Scotland death records	Survival calculated as number of days from diagnosis to death / censored 30th June 2006. Before adjustment, mortality risk was 33% higher for those from deprived areas compared to affluent. Association with deprivation no longer significant after adjustment for WHO performance status, cancer stage, age, cancer site, smoking, alcohol and tumour differentiation. Patients from deprived areas presented with more advanced disease i.e. Stage IV (29% of patients from most affluent vs. 35% from most deprived).
Rylands et al. 2016 (133)	Survival after diagnosis of head and neck cancer	Observational, longitudinal (survival analysis)	Index of Multiple Deprivation (IMD) quartiles	553 patients treated for oral cancer between 2008 and 2012; data from University Hospital	47% of the sample live in the most deprived quartile. Examined survival up to 24 months. No clear gradient in survival by national IMD quartile group but those in most deprived quartile had poorer survival compared to the rest. Unadjusted hazard ratio (relative risk of death) = 1.51 (99%CI: 0.98–2.33) for those in most

				Aintree and ONS mortality data	deprived quartile (IMDQ1) vs. IMDQ2-4. After adjustment for pathology stage and age: HR = 1.54 (99%CI: 1.00–2.39); after further adjustment for gender, tumour site, year of surgery and adjuvant radiotherapy HR = 1.52 (99%CI: 0.98–2.36).
Sharpe et al. 2012 (134)	Incidence of upper aero-digestive tract (UADT) cancer	Analysis of cancer registry data	Scottish Index of Multiple Deprivation; % of households in relative poverty	37,274 lung; 8,216 head and neck; and 6,534 oesophageal cancer patients; all cases from 2000 to 2007; data from Scottish Cancer Registry	Study calculated socio-economic inequality (SEI) via Slope Index of Inequality (SII) and Relative Index of Inequality (RII), in age standardised Incidence Rate per 100,000 population; and contribution of tumour type to all cancer SEI. Head and neck cancer SEI was greater for males than females. Head and neck cancer contributed in males 19%, and in females 9% to All Cancer SEI. Of all head and neck cancers, RII was greatest for laryngeal cancer in both men and women. Extent of inequalities also varied with age.
Taib et al. 2018 (135)	Incidence and mortality for head and neck cancers	Analysis of cancer registry data	English Index of Deprivation, income domain;	Patients diagnosed with head and neck cancer in 1998 to 2000 (n=998) and 2008 to 2010 (n=1397); in Merseyside and Cheshire; data from UK Cancer Information Service; behaviour data from Health Survey for England	Age-standardised incidence rate per 100,000 population of head and neck cancer was estimated for 9 local authorities. Overall incidence rate in Merseyside and Cheshire in 2008-2010 = 16.24, and in Liverpool = 23.49 (England as a whole = 13.2). At Middle Super Output area level, incidence rates in 2008-2010 and mortality rates in 2009-2011 significantly correlated with income deprivation (households on means-tested benefit; r = 0.59); % of households in relative poverty (r=0.53); prevalence of smoking (r=0.51), harmful drinking (r=0.55), and obesity (r=0.28).

Tataru et al. 2017 (136)	Incidence of head and neck cancers	Analysis of cancer registry data	Income domain of the English Index of Multiple Deprivation (IMD)	6,810 patients who were London residents and diagnosed with head and neck cancer between 2006 and 2010, from Thames Cancer Registry	Almost 60% of all cases were from the most deprived areas (quintiles 4–5). Age-standardised incidence rates increased with increasing level of area income deprivation for larynx in males ($p < 0.05$), oral cavity in females ($p < 0.05$) and oropharynx in both males ($p < 0.05$) and females ($p < 0.05$). Thyroid cancer was not related to deprivation level.
Warnaku-lasuriya et al. 2007 (137)	Oral and oropharyngeal cancer	Analysis of cancer registry data (survival analysis)	Index of Multiple Deprivation (IMD), income domain	4,836 patients aged 45+ years and 483 patients under 45 years from SE England and diagnosed with oral and oro-pharyngeal cancer; follow up between 1986 and 2002; data from Thames Cancer Registry	Socio-economic group (IMD income domain quintiles) was a significant predictor of survival. Among patients under 45 years, those in the most deprived areas had a 2.12 times higher mortality risk than those in the least deprived. In the younger age group the trend was substantially attenuated (HR=1.74) and no longer significant by adjustment for stage and treatment. In the older age group, the unadjusted hazard ratio was 1.85 for those in the most deprived compared to the least deprived group; after adjustment this was 1.72 and remained statistically significant.

Table S2.2 Area deprivation and subjective oral health / Oral Health Related Quality of Life

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Subjective or perceived oral health					
Csikar et al. 2016 (138)	Self-rated oral health	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2010	9,657 English adults from 2009 ADHS	Compared to participants living in the most deprived areas (quintile), those in the least deprived areas were less likely (OR = 0.51) to report poor self-rated oral health ('poor' included fair, poor, very poor). Results adjusted for age, gender, ethnicity, geographical region, and smoking status.
Marshman et al. 2010 (139)	Self-rated oral health	Observational cross-sectional	Index of Multiple Deprivation (IMD) 2007, quintiles	Random sample of 10,864 adults (aged 16 and over) living in Yorkshire and Humber region, England, in 2008	Linear social gradient for poor self-rated oral health ('poor' included fair, poor and very poor). Poor self-rated oral health reported by 36.3% of those living in the most deprived quintile, 26.3% of those in the second most deprived, 23.2% of those in the third, 19.2% of those in the fourth and 18.3% of those in the least deprived quintile.
Dental pain or facial pain					
Macfarlane et al. 2014 (42)	Facial Pain (FP)	Observational, cross-sectional	Townsend Index (deciles)	500,488 participants aged 37 to 73 years from UK Biobank study (England, Scotland and Wales)	Standardised prevalence of facial pain = 1.89%; standardised prevalence of chronic facial pain = 0.88%. Clear, linear social gradients apparent for both facial pain and chronic facial pain. Compared to persons living in the least deprived areas (decile), those in the most deprived areas were more likely to report facial pain (RR = 1.47) and chronic facial pain (RR = 1.79). Results sex and age adjusted.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Oral Health Related Quality of Life (OHRQoL)					
Benson et al. 2015 (140)	OHRQoL via CPQ ISF-16	Observational, longitudinal	Index of Multiple Deprivation (IMD) 2010, quartiles	374 children (122 boys, 252 girls) aged 11 to 12 years from 7 different UK schools recruited at baseline; 258 (78 boys, 180 girls) followed-up 3 years	Significant negative association between area deprivation and baseline OHRQoL (rho = -0.11; p=0.034) – the lower the socio-economic status, the worse the OHRQoL at baseline. Results from linear regression: OHRQoL independently associated with IMD after adjusting for gender, self-esteem score, child self-assessed IOTN and DMFS. Change in OHRQoL between baseline and follow-up not associated with IMD.
Masood et al. 2017 (46)	OHRQoL via OHIP-14	Observational, cross-sectional	Index of Multiple Deprivation (IMD)	1,277 participants aged 65 years and older, from UK ADHS	Higher scores = poorer OHRQoL. Weighted mean OHIP-14 score was 3.06 for those living in the most deprived areas (quintile) vs. 2.62 for those in the least deprived areas (unadjusted). Poisson regression analysis: compared to those in the least deprived areas, Incidence Rate Ratio for those in the most deprived areas was 1.21, adjusted for age, gender, marital status, education, social class, active caries, presence of periodontal pockets, PUFA, dental pain, active root caries, tooth wear, bleeding, number of missing teeth, denture wearing, smoking, systemic problems and self-rated general health.
Pau and Allen 2011 (141)	OHRQoL via OHIP-14	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2007, quintiles	3,101 dentate and edentate adults aged 16+ years and living in Medway, England; surveyed in 2009	‘At least one oral impact’ reported by 45% of those living in least deprived quintile and 51% of those in most deprived quintile. Results suggest social gradient, but gradient not entirely linear.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Rylands et al. 2016 (133)	Health related QoL in oral cancer patients, via University of Washington Quality of Life questionnaire (UW-QOL)	Observational, cross-sectional	Index of Multiple Deprivation (IMD) quartiles	553 patients treated for oral cancer between 2008 and 2012; data from University Hospital Aintree	UW-QOL: higher scores = better QoL. Patients completed UW-QOL at various times after treatment (record closest to 2 years from primary surgery or diagnosis selected for analysis). Scores on both physical and socio-emotional function subscales of the UW-QOL were significantly higher among patients living in less deprived areas. Proportion of patients with less than good overall QoL was 34% among those in the most deprived vs. 11% among those in the least deprived quartile. Regression analysis adjusted for age, gender, adjuvant radiotherapy, cancer site, cancer stage and year of surgery: risk of less than good overall QoL was 1.90 times higher for those in the most deprived areas compared to those living elsewhere.
Wells et al. 2016 (142)	Health related QoL in head and neck cancer survivors, via Quality of Life in Adult Cancer Survivors (QLACS)	Observational, cross-sectional	Scottish Index of Multiple Deprivation	280 head and neck cancer survivors who completed up to 5 years previously; from 3 Scottish health regions; surveyed in 2011	Quality of Life in Adult Cancer Survivors (QLACS): higher scores = poorer quality of life (QoL). QLACS has subdomains on generic and cancer-specific QoL. Significant social gradients in both generic and cancer-specific subdomains found with those in more deprived areas having poorer QoL (unadjusted). Results from regression analyses: higher SIMD significantly associated with poorer generic and cancer-specific QoL, adjusted fro age, sex, living alone, smoking, alcohol, employment status, number of comorbidities, treatment other than surgery, time since diagnosis, feeding tube ever fitted, cancer site.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Woolley et al. 2006 (143)	Health related QoL in oral cancer patients, via University of Washington Quality of Life questionnaire (UW-QOL)	Observational, longitudinal	Townsend, Carstairs, Jarman, and IMD-2000 scores	278 consecutive patients who had surgery for oral and oropharyngeal cancer at regional maxillofacial unit in Liverpool between 1995 and 1999; surveyed before and after treatment (6, 12, and 24 months)	No significant associations between UW-QoL composite score and any of the ward-based indicators of deprivation at baseline. At follow-up, using IMD tertiles, patients in the least deprived areas reported better composite UW-QoL scores than those in the most deprived areas, with differences becoming larger at later follow-ups. Similar trends were seen for Townsend, Carstairs, and Jarman scores.

Table S2.3 Area deprivation and oral health related behaviours

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Oral hygiene					
Eckersley and Blinkhorn 2001 (144)	Tooth brushing habits	Observational, cross-sectional	Based on Jarman UPA scores and Townsend Index, largest 3 deprived and largest 4 non-deprived wards	284 parents of children aged 3 years attending nurseries and play groups in Salford, North-West England; 98 from deprived and 186 from non-deprived wards	Brushing at least twice a day: reported by 78% of parents from non-deprived wards and 58% of parents from deprived wards ($p<0.001$). Brushing started before age one: reported by 73% of parents from non-deprived wards and 55% of parents from deprived wards ($p<0.001$). Helping the child with brushing: reported by 63% of parents from non-deprived wards and 45% of parents from deprived wards (p-value not reported).
Levin et al. 2015 (57)	Tooth brushing frequency	Observational cross-sectional	Scottish Index of Multiple Deprivation (SIMD) 2012, quintiles	3,577 pupils (mean age 15.5 years) drawn from the Health Behaviour in School-aged Children (HBSC) Scotland survey, collected in 2010	Results from multilevel logistic regression: Odds for twice-a-day tooth brushing were greatest among those living in the least deprived SIMD quintile (OR=1.80 for boys; OR=2.77 for girls) compared to the most deprived quintile, adjusted for age, family structure, family affluence, school type, and rurality.
Macfarlane et al. 2011 (58)	Mouthwash use	Observational cross-sectional	Scottish Index of Multiple Deprivation, quintiles	3,022 adults aged 25 years and over, from Grampian region of Scotland	Individuals residing in most deprived areas were more likely to use mouthwash (50.6%) than participants from the most affluent areas (40.7%)($p < 0.001$).

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Trubey et al. 2015 (145)	Tooth brushing frequency in the morning and evening	Observational cross-sectional	Welsh Index of Multiple Deprivation (WIMD) 2011, quintiles	298 parents of children aged 3 to 6 years attending nursery or primary schools involved in government-funded Designed to Smile toothbrushing scheme; Swansea and Neath Port Talbot, South Wales	In negative binomial regressions (adjusted for child age, child gender, child age when parent first started brushing their teeth, number of younger and older siblings, strength of parent's habit for brushing, toothpaste choice, stability of routines), the number of weekly missed toothbrushing sessions (both morning and evening) was higher for parents residing in more deprived areas (WIMD = 4 to 5) than parents residing in less deprived (WIMD = 1 to 3) areas. Parents who lived in areas of higher socio-economic deprivation (WIMD = 4–5) were expected to miss brushing their child's teeth significantly more often in the morning (Incidence Rate Ratio = 3.96) and the evening (IRR = 2.07) compared to parents living in areas of less deprivation (WIMD = 1 to 3).
Sugar consumption					
Barton et al. 2015 (146)	Daily consumption of non-milk extrinsic sugar (NMES) (% of food energy)	Analysis of UK food purchase data from 8 cross-sectional surveys	Scottish Index of Multiple Deprivation (SIMD) 2004 and 2009.	5,020 Scottish households (11,374 people) over the period 2001 to 2009; data derived from UK Expenditure and Food Survey (2001 to 2007) and UK Living Costs and Food Survey (2008 to 2009)	NMES consumption (2007-2009) was significantly higher in the most deprived quintile at 15.5% of food energy, compared with 14.3% of food energy in the least deprived quintile. Additionally, the most deprived quintile had the highest intake of sugar-containing soft drinks, with a mean consumption of 284 g/d compared with 180 g/d in the least deprived group. Intake of cakes and pastries was lowest in the most deprived quintile (15g/d) compared with the least deprived quintile (20 g/d). No significant differences found between SIMD quintiles in sweet biscuits, sugar and preservatives, and confectionary consumption categories.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Cameron et al. 2006 (147)	Intake of sugary drinks and sweets	Observational, cross-sectional	Carstairs Index	165 children aged 3 to 11 years attending Glasgow Dental Hospital for extraction of teeth under dental general anaesthesia	No significant relationship between area deprivation and sugar consumption.
Eckersley and Blinkhorn 2001 (144)	Intake of foods and drinks containing non-milk extrinsic sugar (NMES)	Observational, cross-sectional	Based on Jarman UPA scores and Townsend Index, largest 3 deprived and largest 4 non-deprived wards selected	284 parents of children aged 3 years (mean age 43 months) attending nurseries and play groups in Salford, North-West England; 98 from deprived and 186 from non-deprived wards	Drinks containing NMES were given at bed-time or overnight to 24% of children from the deprived and 19% of children from non-deprived wards. Foods containing NMES were given at night to 24% of children in the deprived and 18% of children in non-deprived wards. Consumption of confectionary 4 to 6 times a day was reported by 12% of parents in the deprived but only 1.6% of parents non-deprived wards.
Lakerveld et al. 2015 (148)	Intake of sugary drinks and sweets	Observational, cross-sectional, cross-country study in Belgium, France, Hungary, Netherlands and the UK	Area-level income (categorised into high and low = 1st and 3rd tertiles of the distribution in each country)	860 residents of Greater London; mean age 49	In the UK (Greater London), no significant differences in consumption of sugary drinks and intake of sweets between high and low SES neighbourhoods.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
MacNeill et al. 2010 (149)	Intake and sources of non-milk extrinsic sugars (NMES)	Observational cross-sectional	Scottish Index of Multiple Deprivation (SIMD) 2006, quintiles	1,398 children aged 3 to 17 years drawn from the Department of Work and Pensions Child Benefit Register; Scotland	Data collected via food frequency questionnaire (FFQ). Daily intake of sugar-sweetened soft drinks in the most deprived quintile was 234 g/d, almost twice that of the least deprived quintile, which was 123g/d (<0.001). Intake of fruit juice was 41 g/d for the most deprived and 87 g/d for the least deprived group (p < 0.001). No significant difference by IMD quintiles in mean daily intake of biscuits, cakes and pastries. NMES as a percentage of total energy: 18.4% in most deprived and 16.3% in least deprived quintiles (p = 0.001).
MacNeill et al. 2017 (150)	Intake and sources of non-milk extrinsic sugars (NMES)	Observational, two cross-sectional surveys	Scottish Index of Multiple Deprivation (SIMD)	Children aged 3 to 17 years drawn from Child Benefit Register in 2006 (n=1,391) and 2010 (n=1,674); Scotland	Data for 2006 shown under MacNeill et al. 2010. For 2010, daily intake of sugar-sweetened soft drinks in the most deprived quintile was 195 g/d, and in the least deprived quintile 111g/d (p<0.001). Daily confectionary intake was 23 g/d in the most deprived and 16 g/d in the least deprived quintile (p<0.001). Fruit juice consumption was 43 g/d in the most deprived and 74 g/d in the least deprived areas (p<0.001). Percentage of food energy derived from NMES in 2010 was 16.7 % among children in most deprived and 15.2% among children in least deprived areas (p = 0.001).
Spence et al. 2014 (151)	Change in mean daily intake of non-milk extrinsic sugars (NMES),	Observational, two cross-sectional surveys	Index of Multiple Deprivation (IMD), tertiles	Children attending primary schools in Newcastle, North East England over two academic years in 2003 to 2004 (368 children, mean age	In both years, children from across the deprivation levels who ate a school lunch had a lower per cent energy (%E) from NMES compared with children who ate a home-packed lunch. In 2003/4, the difference between a school and home-packed lunch in the least deprived group was 0.5%E and in the most deprived group 2.1%E. In 2008/9, the difference between a

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
	before and after 2008 legislation on nutritional standards for primary school lunches			5.8 years) and 2008 to 2009 (624 children, mean age 6.1 years)	school and home-packed lunch in the least deprived group was 3.3%E and in the most deprived group 2.2%E. For children consuming a school lunch, % energy from NMES reduced to similar levels for all deprivation groups. For children consuming a home-packed lunch, decrease was more marked in the most deprived group. In 2008/9, children from least deprived areas consuming a home-packed lunch had 17.7 %E from NMES, while for children in the most deprived group it was 16.5 %E.

Table S2.4 Area deprivation and service use

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Dental attendance					
Csikar et al. 2016 (138)	Symptomatic dental attendance	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2010	9,657 English subjects aged ≥ 16 from 2009 Adult Dental Health Survey	In logistic regression, people from less deprived areas were less likely to report symptomatic attendance (vs. regular check-ups) than people from most deprived areas (all categories p<0.001), adjusted for age, gender, ethnicity, smoking status and UK region. Compared to the most deprived quintile, those from the least deprived quintile were 65% less likely to report symptomatic dental attendance (OR=0.35).
Eckersley and Blinkhorn 2001 (144)	Dental attendance (age at first visit; type of service; attendance pattern)	Observational, cross-sectional	Based on Jarman UPA scores and Townsend Index, largest 3 deprived and largest 4 non-deprived wards selected	284 parents of children aged 3 years (mean age 43 months) attending nurseries and play groups in Salford, North-West England; 98 from deprived and 186 from non-deprived wards	In non-deprived areas, 46% of children had attended a dentist by age 1 year, 30% by age 2, 13% by age 3 and 11% never. In deprived areas, 31% of children had attended by age 1 year, 30% by age 2, 13% by age 3 and 23% never. In non-deprived areas, 86% of children had attended general dental practitioners and 2% public dental clinics; for children from deprived areas these were 63% and 13%. Asymptomatic attendance reported for 87% of children from non-deprived and 58% from deprived wards; symptomatic attendance reported for 3% from non-deprived and 18% from deprived wards.
Gallagher et al. 2009 (152)	Dental registration	Retrospective, cross-sectional, ecological study	Index of Multiple Deprivation	About 1.5 million children and adults resident in South East London, registration	For children, strong negative correlation between area deprivation and registration rates at ward level, i.e. higher deprivation associated with lower registration rates; and weaker association in same direction for older

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
			(IMD) 2001, ward level	data on 30th Sept 2003	adults aged 65 and older. No association for adults aged 18-64.
Jones 2001 (153)	Dental registration under capitation; lapses in capitation registrations	Retrospective, cross-sectional, ecological study	Jarman Under Privileged Area score; Department of the Environ-ment (DoE) index of local conditions	NHS child dental registration data for children < 18 years old; from 100 English Health Authorities in 1996 to 1997 and 1997 to 1998; 1991 census data	Results suggest inverse dental care law for children in England: lower registration rates and higher lapse rates were associated with higher levels of area deprivation. Associations for both outcomes curvilinear.
Lang et al. 2008 (78)	Symptomatic dental attendance	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2004, quintiles	4,240 adults aged 65 or over, from Health Survey for England 2005	In logistic regression analysis adjusted for age and sex, higher deprivation level associated with higher likelihood of symptomatic dental attendance (RRR for trend =1.37, p for trend <0.001). Compared to those living in the least deprived quintile, individuals from the most deprived quintile had a more than 3 times higher risk of using dental services only when symptomatic (RRR = 3.12). After adjusting for region, urbanisation, education, social class, self-rated health, smoking: RRR = 2.25; mental health measures did not add further.
Marshman et al. 2010 (139)	Dental attendance; perceived treatment need; access to care	Observational cross-sectional	Index of Multiple Deprivation (IMD) 2007, quintiles	Random sample of 10,864 adults (aged 16 and over) living in Yorkshire and Humber region, England, in 2008	Treatment need reported by 19.3% of those living in the least deprived quintile vs. 35.0% of those from the most deprived quintile. Dental attendance more than 2 years ago reported by 25.3% of dentate people in the most deprived vs. 8.8% in the least deprived areas. Visiting for regular check-ups among dentate reported by 81.6% in

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
					the least deprived vs. 57.9% in the most deprived quintile. Difficulty accessing routine dental care reported among dentate by 30.5% in the most deprived vs. 16.8% in the least deprived quintile.
Maunder et al. 2006 (154)	Registration with dental services at ward level	Observational cross-sectional	Index of Multiple Deprivation (IMD) 2000	146,180 children aged 0 to 17 years, North East England (Durham and Tees Valley)	Strong association between deprivation level and registration rates: for each 10 unit increase in the IMD, probability of a child being registered reduced by about 5%.
Milsom et al. 2006 (155)	Dental attendance and treatment received after screening	Observational, prospective cohort study	Index of Multiple Deprivation (IMD)	8,505 children aged 6 to 9 years, from 169 state maintained schools in Runcorn, Widnes, St Helens and Knowsley	Children in the most affluent quintile were less likely to be referred from dental screening than children in the most deprived quintile, but once referred, children in the most affluent quintile were more likely to attend a dentist than children in the most deprived quintile. 34 % of children in the most affluent quintile received treatment for carious permanent teeth identified through screening, vs. 16% in the most deprived quintile. Authors conclude that “programme fails to reduce inequalities in utilisation of dental services.”
Nuttall 2001 (21)	Dental attendance (attendance for regular check-ups)	Observational, cross-sectional	Carstairs Index (7 categories)	1,171 Scottish adults from 1998 ADHS	Data suggest linear social gradient. Among those in the least deprived areas (DEPCAT 1 and 2), over 70% attended for regular check-ups, compared to 62% in DEPCAT 3; 48% in DEPCAT 4, 49% in DEPCAT 5, and 28% of those in the most deprived areas (DEPCAT 6 and 7).

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Pau and Allen 2011 (141)	Dental attendance (symptomatic attendance; last visit >2 years ago); perceived treatment need	Observational, cross-sectional	Index of Multiple Deprivation (IMD) 2007, quintiles	3,101 dentate and edentate adults aged 16+ years and living in Medway, England; surveyed in 2009	Linear social gradient in symptomatic dental attendance: symptomatic attendance (only when in pain) reported by 21% in least deprived vs 42% in most deprived areas. Last dental visit more than 2 years ago reported by 13% in least deprived vs 22% in most deprived areas (results suggest social gradient, but gradient not entirely linear). 'Need for dental treatment if were to visit the dentist tomorrow': reported by 25% of those living in least deprived quintile and 39% of those in most deprived quintile (results suggest social gradient).
Tickle, Moulding, Milsom and Blinkhorn 2000 (115)	Contact (registration) with dental services at ward level	Observational, cross-sectional	Jarman Under Privileged Area score	1,815 registered and 1,108 unregistered 3 to 5 year old children resident in Ellesmere Port in the North West of England; CDS and GDS data; child population data from HA population register	Significant linear relationship between rates for 3-5 year olds in contact with dental services and Jarman score: lower contact rates in more deprived areas and higher contact rates in less deprived areas (p=0.001). Jarman scores explained 67% of the variability in contact rates at ward level.
Other outcomes related to service use					
Blinkhorn 2000 (156)	Emergency attendance for dental trauma to permanent incisors	Observational, cross-sectional	ACORN classification (I= affluent; II= intermediate; III= poor	2,022 school children aged 11 to 14 years, from 24 secondary schools in North West England	Among all children who had experienced dental trauma, those from ACORN group I were more likely to have sought emergency treatment than those from groups II and III. In ACORN group I, 79% of those who experienced dental trauma had sought treatment; compared to 40% in group II and 42% in group III.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
			quality housing of low income residents		
Dyer et al. 2010 (157)	NHS dental registration; use of emergency services and NHS direct call activity	Observational, cross-sectional	Proportion of people on income support at ward level	Children and adults in Sheffield, data from 2002 to 2004; sample size not given	NHS registration rates were negatively correlated with deprivation levels. Unscheduled attendance rates at Sheffield Dental Hospital and NHS Direct Calls were higher in more deprived areas.
Landes and Jardine 2009 (158)	Area deprivation levels for patients seen under restrictive contracts	Observational, cross-sectional; analysis of data from all dental practices in North East England with restrictive contracts	Index of Multiple Deprivation (IMD) 2007	34,655 patients seen under restrictive contracts in 2007 to 2008 in North East of England; of whom 72% were under 18 years old; postcodes provided by Business Services Agency	Proportionately more patients residing in the least deprived deciles and fewer patients from the more deprived deciles were seen under restrictive contracts (dentists providing NHS services only to children and patients exempt from paying dental charges). Authors conclude that because there were still several thousands of patients from most deprived areas who received care under these contracts, that these contracts “may be of benefit in addressing health inequalities”.
Landes and Jardine 2010 (159)	Correlation between deprivation scores of dental practices and	Analysis of audit data	Index of Multiple Deprivation (IMD) 2007, quintiles	224,107 patients from 59 practice locations in County Durham, England; postcodes provided by Business	Practices located in the poorest areas tended to be accessed by higher proportions of patients from deprived communities. Practice location IMD and percentage of practice population resident in quintile 5 were highly correlated: r = 0.77.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
	patients' postcodes			Services Agency; data from equity audit	
Milsom et al. 2009 (160)	Use of dental access centre vs. general dental practice	Observational, cross-sectional	Index of Multiple Deprivation (IMD)	215 adults aged 18 years and over, from 3 dental access centres and 3 local dental practices in Halton, St Helens and Warrington in 2007	Adults from deprived communities, younger adults, adults with active disease, adults with a preference for symptomatic attendance and adults exempt from patient charges were more likely to attend a dental access centre (DAC) than a general dental practice. The mean IMD score for DAC patients was 38.8 vs. 23.3 for those visiting 'high street' dental practices (higher score = higher level of deprivation).
Moles and Ashley 2009 (161)	Pattern of hospital admissions for dental care	Analysis of data from Hospital Episodes Statistics database	Index of Multiple Deprivation (IMD)	470,113 children aged up to 17 years; data from 1997 to 2006; England	More episodes of care provided for children from more deprived areas compared to more affluent areas (30% vs. 14%). Compared to those from most deprived areas, children from the least deprived areas were 33% less likely to present as an emergency, 75% less likely to present with caries, 48% less likely to undergo extractions and 22% less likely to have multiple hospital episodes over the study period.
Morris and Landes 2006 (162)	Claim rate for orthodontic treatment at ward level	Analysis of Dental Practice Board data	Index of Multiple Deprivation (IMD) 2000	Children aged 10 to 17; Dental Practice Board data for County Durham and Tees Valley Strategic Health Authority area 2002 to 2003 and	Study plotted claim rates against IMD for each ward. At risk population for each ward defined as the number of children between the ages of 10 and 17 resident in each ward. More deprived wards had lower claim rates; correlation between claim rate and area deprivation: r = -0.40.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
				2003 to 2004; data on child population per ward from ONS	Inequity in access to orthodontic care – children living in more deprived wards were less likely to access orthodontic treatment.
Tickle, Moulding, Milsom and Blinkhorn 2000 (163)	Service type used (GDS, CDS)	Observational, cross-sectional	Super Profiles geo-demographic classification (quintiles)	5,378 children aged 0 to 5 years and resident in Ellesmere Port in the North West of England in 1998; CDS and GDS records; child population data from HA population register	44% of sampled children lived in the most deprived areas (or quintile), and 11% lived in the least deprived. Children who used the CDS service were more likely to come from the most deprived areas. Among children who attended community dental services, 67% lived in the most deprived and 5% in the least deprived areas. Among children who attended general dental services, 34% lived in the most deprived and 14% in the least deprived areas. Of all unregistered children, 50% lived in the most deprived and 9% in the least deprived areas.
Tickle et al. 2002 (116)	Tooth extractions	Observational, longitudinal	Townsend Index	658 children who were born in 1984 to 1985 and regularly attending 50 GDPs in the North West of England (data from case notes 1990 to 1999)	Area deprivation not significantly associated with number of carious teeth, but with total number of extractions: children in the most deprived areas had on average 3.5 teeth extracted compared to 1.73 teeth among children in least deprived areas. Logistic regression adjusted for sex, number of carious teeth and % of carious teeth filled: higher Townsend score associated with higher odds of extractions (OR = 1.11). No association between area deprivation and extractions owing to pain and sepsis, or % of carious teeth filled. “Results suggest that dentists are preferentially prescribing prophylactic extractions; that is extractions other than those for pain or sepsis, for poorer children”.

Author and year	Outcomes	Study design	Measure of area SEP	Study population	Key findings
Tickle et al. 2003 (164)	Receipt of preventive and restorative care	Observational, longitudinal	Townsend Index	677 children who were born in 1984 to 1985 and regularly attending 50 GDPs in the North West of England (data from case notes 1990 to 1999)	Results from logistic regression models adjusted for gender, total number of carious teeth and % of carious teeth filled: No association between area deprivation and provision of dietary advice or prescription of fluoride tablets. Children from more deprived areas were significantly more likely to receive oral hygiene instruction than those from less deprived areas. Odds for application of fluoride varnish decreased significantly as area deprivation increased.

Table S3.1 Ethnicity and clinical outcomes (dental caries, periodontal disease, tooth loss, dental trauma, oral cancer)

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
Dental caries				
Arora et al. 2017 (165)	Self-reported number of fillings; presence of dental caries (one or more teeth with untreated decay)	Observational, cross-sectional	11,059 adults from 2009 ADHS including 10,435 (94.6%) White, 272 (2.5%) Indian, 165 (1.5%) Pakistani / Bangladeshi and 187 (1.7%) Black participants; For dental caries: subgroup of 6,228 dentate participants who were clinically examined (grouped into 5,909 White and 319 South Asian)	Fillings: Having any fillings reported by 87.5% of White; 61.0% of Indian; 61.8% of Pakistani/Bangladeshi; and 60.8% of Black participants. Logistic regression adjusted for age, sex, education, housing tenure, area deprivation, consumption of sugary foods and drinks, smoking, oral hygiene, dental attendance: Indians 66% less likely; Pakistani/Bangladeshis 46% less likely and Blacks 58% less likely to report any fillings compared to Whites. Dental caries: South Asians less likely to have untreated caries than Whites (fully adjusted OR = 0.42).
Bedi et al. 2000 (166)	dmft; being caries-free; rampant caries (caries in 2 upper incisors or dmft ≥ 8)	Observational, four cross-sectional surveys	883 school children aged 4 to 5 years from Old Trafford, Manchester, who took part in surveys in 1989, 1990, 1991, 1998; including 213 White, 313 South Asian with English speaking mothers (ESM), 187 South Asian with non-English speaking mothers (NESM) and 158 African Caribbean children	Improvements in caries experience between 1989 and 1998 were largest for White children. In 1998, % caries-free was 67.9% among White, 66.7% among African Caribbean, 41.9% among South Asian NESM and 34.4% among South Asian ESM children. Across all survey years together, compared to White children, South Asian NESM children had significantly higher dmft scores, were less likely to be caries-free (OR=0.53), and more likely to have rampant caries; while African-Caribbean children were more likely to be caries-free (OR=1.53) and less likely to have rampant caries (adjusted for age, sex and survey year).

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
Conway et al. 2000 (95)	d3mft (dental caries into dentine); % caries-free	Observational, cross-sectional	649 5 year olds from multi-ethnic schools in Greater Glasgow, surveyed in 2001 to 2002; including White (52%), Pakistani (33%), and other minority ethnic groups (15%)	Pakistani children had significantly higher d3mft scores (mean d3mft = 4.1) compared to White children (mean d3mft = 2.3). Among Pakistani children, 25% were caries free compared to 48% among White children. In GLM model after adjusting for area deprivation, the mean d3mft of Pakistani children was 1.7 times higher than for White children. No interaction between ethnicity and area deprivation.
Davies et al. 2001 (167)	dmft; any caries experience; nursing caries (caries in upper primary incisors)	Observational, cross-sectional	236 randomly selected children aged 3 to 4 years, attending nurseries in one district in Greater Manchester; including 210 Non-Asian and 26 Asian children	Asian children had higher mean dmft scores than Non-Asian children (mean dmft Asian = 2.58; mean dmft Non-Asian = 1.21; p=0.06). 38% of Asian children had caries experience compared to 20% of Non-Asian children. 35% of Asian children had nursing caries compared to 12% of Non-Asian children.
Delgado-Angulo et al. 2016 (4)	DMFT	Observational, cross-sectional	Random sample of 2,013 adults and adolescents aged 16 to 65, from East London Oral Health Inequality (ELOHI) Study (living in East London in 2009 to 2010)	Compared to White British, DMFT on average 22% higher for White Eastern European and 27% higher for White Other groups; but lower for all Black (African 52%, Caribbean 34% and Other 32% lower than White British) and Asian groups (Pakistani 49%, Indian 41%, Bangladeshi 47% and Other 30% lower than White British). Results adjusted for age, sex, education, nativity / time lived in the UK, and social class. Similar results for number of filled and missing teeth but no differences between groups for number of decayed teeth. Pakistani

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
				and Bangladeshi groups had more missing than filled teeth.
Dugmore and Rock 2005 (97)	DMFT, any caries experience	Observational, cross-sectional	Random sample of 1,753 12 year old children from all schools in Leicestershire and Rutland, England; including 1,357 (79%) White Caucasian, 316 (18%) South Asian and 58 (3%) Other children	White children had significantly higher caries levels than South Asian children. Mean DMFT among White children = 1.09; among Asian children = 0.72 (non-Muslim Asian = 0.68; Muslim Asian = 1.14). Active decay present in 32.8% of White and 24.4% of Asian children. Any caries experience: 45% of White and 38% of Asian children. But: no differences between ethnic groups in low deprivation areas (Townsend Index), differences largest in high deprivation areas.
Gray et al. 2000 (168)	d3mft (dental caries into dentine); any caries experience	Observational, cross-sectional	554 school children aged 5 years from comparable neighbourhoods (all fluoridated with ACORN code 'striving') in Dudley, England; including 464 White and 79 South Asian children	South Asian children had significantly higher caries levels than White children. Mean d3mft among White children = 1.06; mean d3mft among South Asian children = 1.43 ($p<0.05$). Any caries experience: 32% of White and 43% of Asian children (difference not statistically significant). Any untreated decay: 28% of White and 43% of South Asian children ($p<0.05$).
Marcenes et al. 2013 (169)	dmft; any caries experience	Observational, cross-sectional	1,285 children aged 3 to 4 years attending 60 nurseries in deprived areas in London (Tower Hamlets, Hackney and Newham): White British (11%), White Eastern European (2%), White Other (3%), Black African (16%), Black Other (7%), Indian (7%), Bangladeshi	White Eastern European (mean dmft = 2.56), Bangladeshi (mean dmft = 1.25) and Pakistani (mean dmft = 1.39) children had significantly higher dmft scores than White British (mean dmft = 0.60). Compared to White British children, White Eastern European (OR = 4.62) and Bangladeshi children (OR = 2.08) were more likely to have caries experience. White Eastern European children were 3.71 times more likely to have any untreated caries

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
			(30%), Pakistani (6%), Asian Other (5%), Middle Eastern (4%), Mixed (3%), Other (1%), unclassified (5%)	than White British children. The number of untreated carious teeth was significantly higher among White Eastern European, Bangladeshi and Pakistani compared to White British children.
Newton et al. 2002 (170)	D,M, and F components of DMFT	Observational, cross-sectional	Convenience sample of 376 adults aged over 45 years in South East England: Bangladeshi (n=21), Black Caribbean (n=44), Black African (n=20), Pakistani (n=64), Indian (n=108) and Chinese (n=75); 'network' sampling	Mean number of decayed teeth ranged from 0.05 among Black African and 0.62 among Bangladeshi participants. Mean number of missing teeth ranged from 2.90 among Black African and 10.91 among Black Caribbean participants. Mean number of filled teeth ranged from 1.29 among Chinese and 4.67 among Pakistani participants.
Pine et al. 2003 (171)	dmft	Observational, cross-sectional	5 year old children from 2 Primary Care Trusts in Greater Manchester (BASCD survey): 1,089 White and 438 Asian children from Rochdale PCT; 1,717 White and 147 Asian children from Bury PCT; 'Asian' refers to Indian subcontinent	Marginal mean dmft adjusted for deprivation (Townsend Index) was compared between White and Asian children. Asian children had a higher dmft than White children. In Rochdale PCT, mean dmft for White children = 3.3 and mean dmft for Asian children = 5.2; in Bury mean dmft for White children = 2.3 and mean dmft for Asian children = 3.6.
Robinson et al. 2000 (172)	Prevalence of untreated caries; prevalence of ≥ 18 sound (never decayed) teeth; DMFT	Observational, cross-sectional	928 adults from 44 minority ethnic groups living in South Thames Region of England: Black Caribbean (141), Black African (134); Pakistani (123); Indian (190); Bangladeshi (78); Chinese or Vietnamese (143); Other (119)	Prevalence of any untreated decay (unadjusted) was 11.3% among Black Caribbean, 17.2% among Black African, 21.1% among Pakistani, 20.0% among Indian, 15.4% among Bangladeshi, and 21.0 among Chinese/Vietnamese groups. In age-stratified analyses, prevalence of ≥18 sound (never decayed) teeth was higher among all ethnic minority groups when compared to participants in the 1988 ADHS living in South England.

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
Periodontal disease				
Arora et al. 2017 (165)	Presence of one or more periodontal pockets ≥6mm	Observational, cross-sectional	Subgroup of 6,228 dentate participants from 2009 Adult Dental Health Survey (England, Wales and Northern Ireland) who were clinically examined; grouped into 5,909 White and 319 South Asian	No significant difference in the odds of having periodontal pockets between White and South Asian participants, either before or after adjustment (OR = 1.27 for South Asians compared to Whites; adjusted for age, sex, education, housing tenure, area deprivation, consumption of sugary foods and drinks, smoking, oral hygiene, dental attendance).
Delgado-Angulo et al. 2016 (13)	Pocket depth (PD) ≥4mm; loss of attachment (LOA) ≥4mm	Observational, cross-sectional	Random sample of 1,925 adults and adolescents aged 16 to 65, from East London Oral Health Inequality (ELOHI) Study (living in East London in 2009 to 2010)	Compared to White British, number of teeth with PD≥4 mm was 1.70, 1.78, 2.13 and 1.65 times higher in Pakistani, Indian, Bangladeshi and Asian Others, respectively. Number of teeth with LOA≥ 4 mm was 1.55, 2.09 and 1.77 times higher in White Eastern Europeans, Black Africans and Bangladeshis. Results adjusted for age, sex, education, and social class. When stratified by education, ethnic disparities in both measures were found only among those with higher levels of education.
Moore et al. 2001 (15)	Plaque score; pocket probing depth; loss of attachment; bleeding on probing	Observational, cross-sectional	2,027 pregnant women aged 14 to 45 years, attending Guy's Hospital in London (1,252 White, 578 Black and 197 'Other')	Unadjusted: No significant differences between the 3 ethnicity groups in mean plaque scores and mean loss of attachment; but differences in mean bleeding scores (White = 20.0%; Black = 19.8%; Other= 23.1%) and mean probing depth (White= 1.95mm/site; Black= 2.13mm/site; Other= 2.02mm/site). In linear regression adjusted for age, social class, smoking and plaque score, only mean probing depth associated with ethnicity (point estimates

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
				not reported - unclear which group had higher probing depth).
Newton et al. 2000 (173)	Bleeding gums via Subjective Oral Health Status Indicators (SOHSI) scales	Observational, cross-sectional	1,057 dentate adults from ethnic minority communities in South East England (101 Bangladeshi, 141 Black Caribbean, 142 Black African, 143 Pakistani, 224 Indian, 161 Chinese and 145 'Other' participants); 'network' sampling	No significant difference between ethnic groups in prevalence of bleeding gums (self-reported).
Tooth loss				
Arora et al. 2017 (165)	Self-reported number of teeth; edentulous-ness	Observational, cross-sectional	11,059 adults from 2009 ADHS including 10,435 (94.6%) White, 272 (2.5%) Indian, 165 (1.5%) Pakistani / Bangladeshi and 187 (1.7%) Black participants	Having 20 teeth or more reported by 75.3% of White; 92.3% of Indian; 95.7% of Pakistani/Bangladeshi; and 81.8% of Black participants. Edentulousness reported by 7.6% of Whites; 2.6% of Indians; 0% of Pakistani/Bangladeshis and 5.4% of Blacks. Logistic regression adjusted for age, sex, education, housing tenure, area deprivation, consumption of sugary foods and drinks, smoking, oral hygiene, dental attendance: Indians 70% less likely and Pakistani/ Bangladeshis 74% less likely to have < 20 teeth than Whites; no difference between Whites and Blacks.
Delgado-Angulo et al. 2016 (4)	Missing teeth (MT) component of DMFT	Observational, cross-sectional	Random sample of 2,013 adults and adolescents aged 16 to 65, from East London Oral Health Inequality (ELOHI) Study (living in	Compared to White British, MT on average 42% higher for White Other groups; but 56% lower for Black African, 31% lower for Black Other, 40% lower for Pakistani, 40% lower for Indian, 41% lower for Bangladeshi and 22% lower for

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
			East London in 2009 to 2010); 12 ethnic groups included, 54% of sample White British	Other ethnic groups. Results adjusted for age, sex, education, nativity / time lived in the UK, and social class. Pakistani and Bangladeshi groups had more missing than filled teeth.
Pau and Croucher, 2001 (174)	Self-reported number of teeth; edentulous-ness	Observational, cross-sectional, pilot study	54 Chinese elders aged 54 to 87 years, resident in Inner London	17 participants (32%) reported to have 20 or more teeth; 27 (50%) had 1-19 teeth and 10 (18%) were edentulous.
Robinson et al. 2000 (172)	Prevalence of ≥ 18 sound (never decayed) teeth; edentulous-ness	Observational, cross-sectional	928 adults from 44 minority ethnic groups living in South Thames Region of England: Black Caribbean (141), Black African (134); Pakistani (123); Indian (190); Bangladeshi (78); Chinese or Vietnamese (143); Other (119)	In age-stratified analyses, prevalence of ≥18 sound (never decayed) teeth was higher, and prevalence of edentulousness was lower, among all ethnic minority groups when compared to participants in the 1988 ADHS living in South England. (Caveat: small cells due to small n in each ethnic group and stratification into six age groups.)
Dental trauma				
Agel et al. 2014 (32)	Traumatic Dental Injuries (Glendor et al. classification)	Observational, cross-sectional	728 adolescents from state secondary schools in East London, aged 15 to 16 years, from RELACHS study (Research with East London Adolescents Community Health Survey): 180 White, 299 Asian, 161 Black and 88 Mixed or Other participants	TDI prevalence in the sample = 17%. Ethnicity was not significantly associated with TDI experience in unadjusted and adjusted analyses (logistic regression adjusted for age, sex, parental employment, overjet and bullying experience).

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
Ramchandani et al. 2016 (175)	Traumatic Dental Injuries (Glendor et al. classification)	Observational, cross-sectional	794 adolescents from state secondary schools in East London, aged 15 to 16 years, from RELACHS study (Research with East London Adolescents Community Health Survey): 198 White, 333 Asian, 169 Black and 94 Mixed or Other participants Same sample as Agel et al. 2014	TDI prevalence in the sample = 17%. Ethnicity was not significantly associated with TDI experience in unadjusted and adjusted analyses (logistic regression adjusted for age, sex, parental employment, overjet and bullying experience).
Shujaat and Idris 2008 (176)	Traumatic Dental Injuries to permanent incisors (BASCD criteria)	Observational, cross-sectional	Random sample of 589 children aged 14 years, attending state secondary schools in Newham, London. 20 ethnic groups included, 19% of the sample White British	No statistically significant differences in TDI experience between ethnic groups. Prevalence of TDI (unadjusted) was 33.3% among White British/White Irish, 14.6% among Black Caribbean, 31.6% among Black African/Other Black, 21.0% among Indian, 21.6% among Bangladeshi, 33.3% among Pakistani, 28.0% among Sri-Lankan/Other Asian, and 16.3% among 'Other' groups.
Oral cancer				
Csikar et al. 2013 (177)	Incidence of oral and pharyngeal cancers	Analysis of cancer registry data	2,157 patients diagnosed with oral and pharyngeal cancer between 2001 and 2006 in West Yorkshire (from Northern and Yorkshire Cancer Registry), of whom 138 were South Asian (6.4%); population denominators obtained from 2001 census; West Yorkshire data compared to data for England	South Asian women had a significantly higher incidence of oral and pharyngeal cancer than women of other ethnic backgrounds in West Yorkshire and in England. Within West Yorkshire, South Asian patients had a 79% higher risk of being diagnosed with oral and pharyngeal cancer compared with those from other ethnic groups, adjusted for age and sex.

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
Donaldson et al. 2012 (178)	Incidence of oral and pharyngeal cancers, by anatomical sub-sites	Analysis of cancer registry data	5,833 patients who were London residents and diagnosed with oral and pharyngeal cancer between 1998 and 2007, from Thames Cancer Registry; self-reported ethnicity groups: White, Indian, Pakistani, Bangladeshi, Black Caribbean, Black African and Chinese; population denominators from 2001 census	Incidence rate ratios (IRR) for different ethnic groups (reference groups: White males / White females): IRR for oral cavity cancer higher for Bangladeshi (IRR = 5.1), Pakistani (IRR = 2.4) and Indian (IRR = 1.8) females; but lower for Chinese, Black African and Black Caribbean females. Oropharyngeal cancer incidence lower for all male ethnic groups compared to White males. IRR for naso-pharyngeal cancer highest among Chinese males (IRR = 23) and Chinese females (IRR = 16). IRR for Waldeyer's ring cancer lower for most ethnic groups compared to White. Cancers of the hypo-pharynx and salivary glands showed the least ethnic variation.
Elledge et al. 2011 (179)	Health-authority level incidence rate of oral cancers	Library-based ecological study	94 Health Authority (HA) regions in England and Wales; age standardised incidence rates for each region obtained from Office of National Statistics (ONS) Cancer Atlas; percentage of Indian, Pakistani, and Bangladeshi residents in each HA from 1991 and 2001 censuses	No significant correlations between oral cancer incidence rates at HA level and % of residents in the HA who were Indian, Pakistani, or Bangladeshi. Multiple linear regression models stratified by sex and adjusted for lung cancer and oesophageal cancer incidence rates (as proxies for smoking and alcohol) also showed no significant correlations.
McGurk et al. 2005 (180)	Delay in diagnosis / advanced stage at presentation	Analysis of retrospective and prospective hospital data	400 patients treated between 1961 and 1986 at a district general hospital for cancer of the mouth and throat; 205 patients with head and neck cancer treated at a	Non-White ethnicity was associated with advanced stage at presentation but not with delay between recognition of symptoms and diagnosis. Adjusted for age, sex, social status, marital status and smoking, previous history of

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
	of head and neck cancer		cancer centre from 1992 to 1999; ethnic groups: White vs. non-White	cancer and site, histological grade of the tumour, Eastern Cooperative Oncology Group performance status.
Moles et al. 2007 (181)	Oral and pharyngeal cancer mortality	Analysis of cancer registry data, survival analysis	All oral and pharyngeal cancer cases registered between 1980 and 1995 by Thames Cancer Registry in South East England: 4,052 non-South Asian and 132 South Asian males; 2,621 non-South Asian females and 128 South Asian females	British South Asian males had significantly better survival than their non-south Asian peers. Median years of survival to January 2000: non-South Asian men = 2.4; South Asian men = 9.3; non-South Asian women = 2.9; South Asian women = 11.8. Hazard ratios (HR) adjusted for age at diagnosis, cancer stage at diagnosis, and area deprivation (Townsend Index): for South Asian (vs. non-South Asian) men = 0.62 ($p<0.001$); for South Asian (vs. non-South Asian) women = 0.80 ($p=0.098$).
Moles et al. 2008 (129)	Incidence of oral and pharyngeal cancers	Analysis of cancer registry data	6,355 patients diagnosed with oral and pharyngeal cancer in South East England in 1985 to 1995, from Thames Cancer Registry, of whom 282 (4.4%) were South Asian; population denominators obtained from 1991 census with South Asians defined as 'Indian', 'Pakistani' and 'Bangladeshi'	Based on age-standardised incidence rates (per 100 000 person-years), stratified by sex: Adjusted for area socio-economic deprivation, South Asian men had higher relative risk of oral (RR=1.36), but not pharyngeal cancer than non-South Asian men; South Asian women had higher risk of oral (RR=3.67) and pharyngeal cancers (RR=2.06) than non-South Asian women.
Tataru et al. 2017 (136)	Incidence of head and neck cancers	Analysis of cancer registry data	13,859 patients who were London residents and diagnosed with head and neck cancer between 1998 and 2009, from Thames Cancer Registry; White, Black Caribbean, Black African, Indian, Pakistani,	Reported are age-standardised incidence rate ratios. Compared with White males, Black Caribbean (IRR = 0.6), Black African (IRR = 0.5), Pakistani (IRR = 0.5) and Chinese (IRR = 0.2) males had a lower and Indian males had a higher (IRR = 1.5) incidence of oral cancer. Indian (IRR = 2.0), Pakistani (IRR = 2.6) and Bangladeshi (IRR =

Author and year	Outcomes	Study design	Study population and ethnic groups	Key findings
			Bangladeshi and Chinese ethnic groups; population denominators from 2001 census	6.3) females had higher incidence of oral cancer compared with White females, while Black Caribbean (IRR = 0.5), Black African (IRR = 0.4) and Chinese (IRR = 0.4) females had a lower incidence. Variations by cancer site: Bangladeshi females (IRR = 4.9) most likely to be diagnosed with thyroid cancer compared to White females; IRR for nasopharyngeal cancer for Chinese (compared to White) males particularly high (IRR = 26.7).

Table S3.2 Ethnicity and subjective oral health / Oral Health Related Quality of Life

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
Subjective / perceived oral health				
Arora et al. 2017 (165)	Self-rated oral health	Observational, cross-sectional	11,059 adults from 2009 ADHS including 10,435 (94.6%) White, 272 (2.5%) Indian, 165 (1.5%) Pakistani / Bangladeshi and 187 (1.7%) Black participants	Significant differences in self-rated oral health between ethnic groups in unadjusted analyses: Bad/poor oral health was reported by 28.3% of Whites; 27.2% of Indians; 44.2% of Pakistani / Bangladeshis and 31.6% of Blacks.
Csikar et al. 2016 (138)	Self-rated oral health	Observational, cross-sectional	9,657 English adults from 2009 ADHS, including 8,746 White, 64 Mixed Ethnicity, 265 Indian, 165 Pakistani / Bangladeshi, 67 Other Asian, 85 Black Caribbean, 89 Black African, 4 Other Black, and 149 Other participants	Compared to Whites, Pakistani / Bangladeshi participants were more likely (OR = 2.16) to report poor self-rated oral health ('poor' included fair, poor, very poor). No significant differences between Whites and other ethnic groups. Results adjusted for age, gender, area deprivation, geographical region, and smoking status.
Mandall et al. 2000 (182)	Orthodontic aesthetic self-perception; perceived need for orthodontic treatment	Observational, cross-sectional	Stratified, random sample of 334 Asian and Caucasian children aged 14 to 15 years, from schools in Manchester	Ethnicity not independently associated with orthodontic aesthetic self-perception, in analysis adjusted for gender, area deprivation, and clinical treatment need. Ethnicity not independently associated with self-perceived need for orthodontic treatment, in analysis adjusted for gender, area deprivation, Orthodontic Aesthetic Subjective Impact Score, clinical treatment need and orthodontic aesthetic self-perception. Asians had higher orthodontic treatment need as measured by examiners.

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
Pau and Croucher, 2001 (174)	Self-rated oral health	Observational, cross-sectional, pilot study	54 Chinese elders aged 54 to 87 years, resident in Inner London	33 participants (72%) rated the conditions of their teeth as poor or fair.
Dental pain / facial pain				
Macfarlane et al. 2014 (42)	Facial Pain (FP)	Observational, cross-sectional	500,488 participants aged 37 to 73 years from UK Biobank study (England, Scotland and Wales). Ethnicity groups: White (n=472,013); Mixed (n=2,948); Asian/Asian British (n=9,745); Black/Black British (n=8,001); Chinese (n=1,558); Other (4,507); no information (1,716)	Standardised prevalence of facial pain = 1.89%; standardised prevalence of chronic facial pain = 0.88%. Compared to Whites, persons identifying themselves as mixed ethnicity were more likely to report facial pain (RR = 1.27) and chronic facial pain (RR = 1.57); and those identifying as Chinese were less likely to report facial pain (RR = 0.40) and chronic facial pain (RR = 0.40). No differences between Whites and Asian/Asian British or Whites and Black/Black British. Results sex and age adjusted.
Newton et al. 2000 (173)	Subjective Oral Health Status Indicators: toothache during last 4 weeks; pain when eating certain foods	Observational, cross-sectional	1,057 dentate adults from ethnic minority communities in South East England (101 Bangladeshi, 141 Black Caribbean, 142 Black African, 143 Pakistani, 224 Indian, 161 Chinese and 145 'Other' participants); 'network' sampling	Bangladeshi and Chinese respondents reported lower frequency of occurrence of pain when eating certain foods than the other groups. In logistic regression, "presence of toothache was associated with those self classifying as Pakistani".
Newton et al. 2003 (183)	Oral and facial pain via Subjective Oral Health Status	Observational, cross-sectional	Convenience sample of 366 adults in South East England: Black Caribbean (n=65), Chinese	Chinese participants (compared to Non-Chinese) and Indian participants (compared to Non-Indians) more likely to report 'oral and facial pain' symptoms (OR for Chinese

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
	Indicators (SOHSI) scales		(n=101), Indian (n=100) & White (n=100); 'network' sampling	= 2.74; OR for Indians = 2.17). Results adjusted for age and gender.
Pau and Croucher, 2001 (174)	Toothache	Observational, cross-sectional, pilot study	54 Chinese elders aged 54 to 87 years, resident in Inner London	15 participants (28%) reported experience of toothache in the previous 12 months, and 17 participants (31%) reported experience of sensitivity.
Oral Health Related Quality of Life (OHRQoL)				
Abdelrahim et al. 2017 (184)	Oral Health Impact Profile (OHIP-14)	Observational, cross-sectional	Stratified, multi-stage random sample of 705 adults aged 16 and over, resident in London Boroughs of Lambeth, Southwark and Lewisham (478 White, 193 Black and 34 Asian participants)	Prevalence of oral impacts (unadjusted): 12.0% among Whites, 16.9% among Blacks and 4.2% among Asians. In regression analyses adjusted for age group, sex and Borough of residence, extent of oral impacts was higher among Blacks (RR= 1.67) and lower among Asians (RR=0.26) compared to Whites. No significant differences between Whites and other groups in prevalence and severity of oral impacts. Higher extent of oral impacts among Blacks vs. Whites explained after adjustment for social grade.
Arora et al. 2017 (165)	Difficulty eating due to dental problems	Observational, cross-sectional	11,059 adults from 2009 ADHS including 10,435 (94.6%) White, 272 (2.5%) Indian, 165 (1.5%) Pakistani / Bangladeshi and 187 (1.7%) Black participants	Significant differences in 'difficulty eating due to dental problems' between ethnic groups in unadjusted analyses: difficulty eating was reported by 20.7% of Whites; 23.9% of Indians; 28.7% of Pakistani / Bangladeshis and 29.9% of Blacks.
McGrath and Bedi 2001 (48)	OHRQoL-UK (W)	Observational, cross-sectional	Convenience sample of 390 adults including 314 White, 61 Black, 71	Study tested reliability and validity of the OHRQoL-UK (W) instrument.

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
			South East Asian and 37 Chinese/Other participants	Black participants had significantly lower scores on the OHRQoL-UK (W) compared to other ethnic groups (lower scores = poorer OHRQoL).
Newton et al. 2000 (173)	Subjective Oral Health Status Indicators (SOHSI) scales (selected items)	Observational, cross-sectional	1,057 dentate adults from ethnic minority communities in South East England (101 Bangladeshi, 141 Black Caribbean, 142 Black African, 143 Pakistani, 224 Indian, 161 Chinese and 145 'Other' participants); 'network' sampling	No significant difference between ethnic groups in relation to subjective symptoms (difficulty opening mouth; bad breath; bleeding gums); satisfaction with the appearance of teeth and gums; or proportion reporting no impact items (teeth, mouth or facial appearance restricting choice of foods; causing avoidance going out; preventing eating due to embarrassment; spoiling enjoyment of food). Lower proportion of Bangladeshi and Chinese respondents reported 'pain when eating certain foods' than other groups. In logistic regression, 'presence of toothache was associated with those self classifying as Pakistani'.
Newton et al. 2002 (170)	Subjective Oral Health Status Indicators (SOHSI) scales (selected impact items)	Observational, cross-sectional	Convenience sample of 376 adults aged over 45 years in South East England: Bangladeshi (n=21), Black Caribbean (n=44), Black African (n=20), Pakistani (n=64), Indian (n=108) and Chinese (n=75); 'network' sampling	No significant difference between ethnic groups in reporting any impact items (teeth, mouth or facial appearance restricting choice of foods; causing avoidance going out; preventing eating due to embarrassment; spoiling enjoyment of food). Ethnicity did not moderate associations between number of missing teeth and presence of any impacts, or associations between self-assessed symptoms and any impacts.
Newton et al. 2003 (183)	Subjective Oral Health Status	Observational, cross-sectional	Convenience sample of 366 adults in South East England: Black Caribbean (n=65), Chinese	Compared to Non-Chinese, Chinese participants more likely to report impacts on 'ability to chew' (OR = 3.04); impacts on 'ability to speak' (OR = 1.86); 'oral and facial

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
	Indicators (SOHSI) scales		(n=101), Indian (n=100) & White (n=100); 'network' sampling	pain' symptoms (OR = 2.74); eating impacts (OR = 3.15) and impacts on 'activities of daily living' (OR = 2.34). Compared to Non-Indians, Indian participants more likely to report 'oral and facial pain' symptoms (OR = 2.17); eating impacts (OR = 2.84) and impacts on 'activities of daily living' (OR = 3.43). No significant differences between ethnic groups on 'worry/concern' scale. Results adjusted for age and gender.

Table S3.3 Ethnicity and oral health related behaviours

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
Oral hygiene				
Arora et al. 2017 (165)	Frequency of teeth cleaning; use of other dental hygiene products	Observational, cross-sectional	11,059 adults from 2009 Adult Dental Health Survey (England, Wales and Northern Ireland) including 10,435 (94.6%) White, 272 (2.5%) Indian, 165 (1.5%) Pakistani / Bangladeshi and 187 (1.7%) Black participants	Significant differences found in 'frequency of teeth cleaning' and 'use of other dental hygiene products' between ethnic groups in unadjusted analyses: cleaning teeth less than twice a day was reported by 25.0% of Whites; 35.9% of Indians; 24.9% of Pakistani / Bangladeshis and 18.6% of Blacks. Using other dental hygiene products was reported by 58.8% of Whites; 43.3% of Indians; 37.0% of Pakistani / Bangladeshis and 43.6% of Blacks.
Bedi et al. 2000 (166)	Oral cleanliness	Observational, four cross-sectional surveys	883 school children aged 4 to 5 years from Old Trafford, Manchester, who took part in surveys in 1989, 1990, 1991, 1998; including 213 White, 313 South Asian with English speaking mothers (ESM), 187 South Asian with non-English speaking mothers (NESM) and 158 African Caribbean children	Across all survey years together, the Afro-Caribbean group was significantly more likely to have good/fair oral cleanliness than the White ethnic group (OR=2.67). Both South Asian groups were significantly less likely to have good/fair oral cleanliness than the White group (OR= 0.31 and OR= 0.6 respectively), adjusted for age, sex and survey year. In 1998, % with good/fair oral cleanliness was 89.3% among White, 100.0% among African Caribbean, 64.5% among South Asian NESM and 76.3% among South Asian ESM children.
Pau and Croucher, 2001 (174)	Self-reported oral hygiene practices	Observational, cross-sectional, pilot study	54 Chinese elders aged 54 to 87 years, resident in Inner London	74% of participants reported brushing their teeth at least twice daily. Majority used toothpaste and toothbrush for tooth-cleaning. For interdental cleaning, only 2 subjects reported using dental floss, while 34 subjects (63%) used toothpicks.

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
Robinson et al. 2000 (172)	Frequency of tooth brushing	Observational, cross-sectional	928 adults from 44 minority ethnic groups living in South Thames Region of England: Black Caribbean (141), Black African (134); Pakistani (123); Indian (190); Bangladeshi (78); Chinese/Vietnamese (143); Other (119)	Prevalence of daily toothbrushing was 100% among Black Caribbean, 98.5% among Black African, 98.4% among Pakistani, 98.9% among Indian, 98.7% among Bangladeshi, 97.8% among Chinese/Vietnamese groups and 98.3% among others.
Sugar consumption				
Arora et al. 2017 (165)	Consumption of sweets, cakes, fizzy drinks; adding sugar to hot drinks	Observational, cross-sectional	11,059 adults from 2009 ADHS including 10,435 (94.6%) White, 272 (2.5%) Indian, 165 (1.5%) Pakistani / Bangladeshi and 187 (1.7%) Black participants	Significant ethnic differences in all outcomes in unadjusted analyses: Consuming sweets ≥6/week reported by 16.9% of Whites; 14.3% of Indians; 16.4% of Pakistani / Bangladeshis and 3.2% of Blacks. Rarely/never having cakes reported by 7.5% of Whites; 7.4% of Indians; 8.5% of Pakistani / Bangladeshis and 21.9% of Blacks. Rarely/never having fizzy drinks reported by 37.0% of Whites; 29.4% of Indians; 22.4% of Pakistani / Bangladeshis and 15.0% of Blacks. Adding sugar to hot drinks reported by 35.4% of Whites; 7.4% of Indians; 8.5% of Pakistani / Bangladeshis and 21.9% of Blacks.
Bryant et al. 2015 (185)	Home availability of sweet biscuits; chocolate; sweets; cakes; ice cream and	Observational cross-sectional; exploratory	Convenience sample of 100 mothers/homes from the 'Born in Bradford-1000' cohort study; 46 (47%) White British; 41 (42%) Pakistani and 10 (11%) other	85.4% of Pakistani homes had sweetened drinks available, compared with 60.9% of White homes. Proportion of homes with 'diet' beverages available was lower in Pakistani homes (25%) compared to White (31%) and 'Other' (78%). Availability of sugar-sweetened beverages in Pakistani homes was equivalent to around 15 cans of fizzy drinks per

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
	sweetened or unsweetened drinks.			home on average, compared to an average of 7 in White British homes (adjusted for household size). No significant ethnic differences in availability of cakes, chocolate, biscuits or ice cream.
Dykes et al. 2002 (62)	Adding sugar or sugary foods to the baby's bottle at age 9 months	Observational, cross-sectional	764 Indian, 593 Pakistani, 477 Bangladeshi, and 548 White mothers from 41 UK Local Authorities	Unadjusted analysis: compared to White mothers, Bangladeshi mothers were 3.6 times and Pakistani mothers 1.7 times more likely to add sugar to the bottle (no difference between Indian and White mothers). After adjusting for income, social class/employment, income support, family credit, access to a car and maternal education, association attenuated for Bangladeshi mothers (OR = 1.9) and no longer significant for Pakistani mothers.
Goff et al. 2014 (186)	Total sugar intake (percentage of total energy intake)	Observational; cross-sectional	Convenience sample of 133 adults residing in London and surrounding areas; 50 (38%) African-Caribbean and 83 (62%) West African	In both Caribbean and West African diets, sugar-sweetened drinks were the principal source of sugar, with 17.8% and 12.8% respectively (of total sugar intake). In one-way ANOVA analysis, no significant differences regarding sugar consumption were found between ethnicities after adjustment for age, place of birth, length of UK residency and sociodemographic variables.
Sahota et al. 2015 (187)	Consumption of sweet commercial baby foods; sweet snacks; sugary drinks; pure fruit juice;	Observational; longitudinal	Children from 'Born in Bradford-1,000' cohort study; 1259 participated at age 12 months (38% White British and 49% Pakistani); 1,257 at age 18 months (37% White British and 49% Pakistani)	Logistic regression analysis: at age 12 months, Pakistani infants consumed more commercial sweet baby meals than White British infants (OR=1.9) and more sugar-sweetened drinks (OR=1.68). At age 18 months, Pakistani children also consumed more commercial sweet baby meals (OR=4.57), more sugar sweetened drinks (OR=2.03) and more pure fruit juice (OR=1.82) than White British children. However there

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
	artificially sweetened drinks			was a tendency for Pakistani children to consume more fruit, vegetables and less processed meat products. Ethnic differences in sugar intake not explained by mother's or father's education, mother's age and mother's ethnic group.
Stone et al. 2007 (188)	Self-reported sugary items; negative markers (incl. sugary, fatty and salty snacks)	Observational; cross-sectional	3,018 pupils aged 11 to 15 attending secondary schools in an inner-city community in the UK; 2594 (86%) South Asian; 424 (14%) White European	In multivariable analysis, no significant difference was found between South Asian and White European pupils regarding sugary items. However, White European children reported consuming a higher proportion of negative food groups (incl. sugary items) than South Asian children, with a mean of 9.72 (46) and 8.81 (42) respectively. Results adjusted for age, sex, school attended and eating of school lunch.
Robinson et al. 2000 (172)	Number of reported sugar exposures per day	Observational, cross-sectional	928 adults from 44 minority ethnic groups living in South Thames Region of England: Black Caribbean (141), Black African (134); Pakistani (123); Indian (190); Bangladeshi (78); Chinese or Vietnamese (143); Other (119)	Number of daily sugar exposure was 2 for all ethnic groups, except for the Chinese or Vietnam category for whom it was 0.0.

Table S3.4 Ethnicity and service use

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
Al-Haboubi et al. 2013 (74)	Time since last dental visit; satisfaction with care	Observational, cross-sectional	Stratified multistage random sample of 695 individuals from Lambeth, Southwark and Lewisham boroughs. 466 (71%) White; 193 (23%) Black and 36 (6%) Asian participants	69% of participants reported having visited the dentist in the last two years. In Poisson regression analysis, Asian participants were 21% more likely to have visited the dentist in the last 2 years in comparison with White people, and 28% more likely compared to Black people. Adjustment for socio-demographic factors (sex, age, social grade and borough) attenuated associations. No statistically significant difference between ethnic groups in satisfaction with care.
Arora et al. 2017 (165)	Service provider; perception of dental services; frequency of dental visits; ever had scale and polish	Observational, cross-sectional	11,059 adults from 2009 ADHS including 10,435 (94.6%) White, 272 (2.5%) Indian, 165 (1.5%) Pakistani / Bangladeshi and 187 (1.7%) Black participants	Significant differences in 'service provider', 'frequency of visits to dentist' and 'ever had scale and polish' between ethnic groups in unadjusted analyses: Visiting private practices was reported by 28.3% Whites; 21.3% of Indians; 11.5% of Pakistani / Bangladeshis and 16.0% of Blacks. Visiting the dentist more than twice per year was reported by 51.5% Whites; 32.3% of Indians; 32.9% of Pakistani / Bangladeshis and 38.1% of Blacks. 'Ever had scale and polish' reported by 82.6% of Whites; 65.6% of Indians; 71.5% of Pakistani / Bangladeshis and 64.5% of Blacks.
Csikar et al. 2016 (138)	Dental attendance (symptomatic vs. regular check-up)	Observational, cross-sectional	9,657 English adults from 2009 ADHS, including 8,746 White, 64 Mixed Ethnicity, 265 Indian, 165 Pakistani or Bangladeshi, 67 Other Asian, 85 Black Caribbean, 89 Black African, 4	62.2% of the sample reported attending the dentist regularly, 28.0% reported attending the dentist only with symptoms. Odds ratios for symptomatic dental attendance (compared to White British/other White) were 3.75 for Asian-other; 3.42 for Asian-Indian and 2.67 for Black African. No significant differences between Whites and Mixed race, Black

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
			Other Black, and 149 Other participants	Caribbean and other Black ethnic groups. Results adjusted for age, gender, area deprivation, geographical region, and smoking status.
Pau and Croucher, 2001 (174)	Self-reported dental attendance pattern	Observational, cross-sectional, pilot study	54 Chinese elders aged 54 to 87 years, resident in Inner London	17 (31%) participants had visited a dentist in the previous 6 months, 6 subjects (11 %) had visited 6 months to 1 year previously, and 31 (58%) had not visited in the previous year. 32 participants had visited the dentist in the previous 3 years, for which the main reasons for attending were toothache (24%), problems with dentures (22%) and routine examination (13%).
Robinson et al. 2000 (172)	Frequency of dental attendance; type of dentist	Observational, cross-sectional	928 adults from 44 minority ethnic groups living in South Thames Region of England: Black Caribbean (141), Black African (134); Pakistani (123); Indian (190); Bangladeshi (78); Chinese or Vietnamese (143); Other (119)	Prevalence of visiting the dentist annually was 100% among Black Caribbean, 99.2% among Black African, 95.1% among Pakistani, 99.5% among Indian, 81.6% among Bangladeshi, and 92.8% among Chinese/Vietnamese groups. Prevalence of visiting a UK dentist was 91.8% among Black Caribbean, 67.4% among Black African, 94.3% among Pakistani, 92.5% among Indian, 74.0% among Bangladeshi, and 90.3% among Chinese/Vietnamese groups.

Table S4.1 Disability and clinical outcomes (dental caries, periodontal disease, tooth loss, dental trauma)

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
Dental caries					
Ahluwalia et al. 2004 (189)	dmft / DMFT	Observational; cross-sectional	81 children with cleft palate attending craniofacial clinics and 61 control children attending a dental trauma clinic in London; mean age 10.5 years	Cleft palate	Mean dmft for was 2.38 compared to 0.62 for the control group (p<0.001). Mean DMFT for children with cleft palate was 1.56 compared to 0.48 for control children (p<0.001).
Britton & Welbury 2010 (190)	dmft	Observational; cross-sectional	188 children with cleft palate, aged 6 months to 6 years and living in West of Scotland	Cleft palate	Study compared results with the 2008 National Dental Inspection Program of Scotland (NDIP). Stratified by age. Percentage caries-free: 37.2% of children with cleft palate aged 4.5 to 6.0 years were caries free, compared to 57.7% of 5 year olds in NDIP (p<0.004). No significant difference between sample and NDIP among 3 year olds. Mean dmft among children with cleft palate aged 3.5-4.5 years was 0.94 compared to 0.97 among 3 year olds in NDIP. Mean dmft for children with cleft palate aged 4.5 to 6.0 years was 3.24, compared to 1.86 for 5 year olds in NDIP.
Chapple & Nunn 2001 (191)	dmft / DMFT	Observational; cross-sectional	91 children aged 4, 8, and 12 years attending cleft audit clinics at the Newcastle Dental Hospital	Cleft palate	Cleft types were classified as: lip, palate, and lip and palate. 41% of the children were caries free in one or both dentitions. Mean dmft by cleft type: 0.86 for lip; 1.20 for palate and 1.73 for lip and palate. Mean

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
					DMFT by cleft type: 0.71 for lip; 0.98 for palate and 0.96 for lip and palate cleft type.
Choa et al. 2014 (192)	dmft	Observational; retrospective	287 children aged between 5 and 6 years from 3 UK regional cleft centres: West Midlands, South West/South Wales and Spires. Cleft types classified as: lip, lip and alveolus, palate, unilateral lip and palate and bilateral lip and palate	Cleft palate	No statistical difference found between dmft and cleft type if cleft types were considered unrelated (p=0.09). However, if cleft types' severity was considered, significant linear trends in percentage with dmft ≥ 1: caries prevalence increased with increasing severity (p<0.01).
Cumella et al. 2000 (193)	DMFT	Observational; cross-sectional	50 adults with learning disability from North Warwickshire Special Needs Register	Learning disability	Compared to adults in England (1988 ADHS), subjects from the sample had higher mean values for decayed teeth (2.9 vs. 1.0) and missing teeth (8.4 vs. 7.6) but fewer filled teeth (5.0 vs. 8.4). Overall DMFT mean was 16.3 for study sample vs. 17.0 for general population.
Eldridge & Gallagher 2000 (194)	dmft / DMFT	Observational; cross-sectional	30 paediatric (mean age 5.8 years) HIV-infected outpatients attending a South London hospital	HIV	19 children (33%) had experienced dental caries. Mean dmft/DMFT was 4.4. Among those with caries experience, mean dmft/DMFT was 7 and 95% of them (n=18) had untreated decay.
Lucas et al. 2000 (195)	dmfs; dmft; DMFS, DMFT	Observational; cross-sectional	60 children (aged 3 to 15 years) attending the Cleft Clinic at Great Ormond Street Hospital and 60	Cleft palate	Groups were matched for age, sex, ethnicity and social class.

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
			control children from Guy's Hospital, London		In bivariate analysis, none of the caries-related indices showed a significant difference between the cleft lip and palate group and the control group.
Percival et al. 2009 (196)	dmfs; dmft; DMFS, DMFT	Observational; cross-sectional	39 children with intractable epilepsy attending the UK National Centre For Young People with Epilepsy, and 39 healthy children from local schools in Surrey	Epilepsy	Groups matched for age, sex and ethnicity. In unadjusted analyses, no significant differences found in any caries-related indices between children with epilepsy and control children. 25.6% of the epileptic children were caries free compared to 33.3% of the matched controls. Mean dmft was 1.0 for epileptic children and 2.0 for controls. Mean DMFT was 2.5 in the epilepsy group and 1.9 among controls.
Richards et al. 2015 (197)	dmft	Observational; retrospective	99 children aged 5 years who had received a cleft palate repair, from Birmingham Children's Hospital Cleft Service	Cleft palate	Comparisons were made between patients with (n=29) and without fistula (n=70). Having a dmft>0 was found in 40% of children with fistula compared with 20% in children without fistula (p=0.03). Children with fistula were more likely to have 2 or more decayed teeth than children without fistula (OR= 5.68, p= 0.005).
Sheehy et al. 2000 (198)	dmfs; dmft; DMFS, DMFT	Observational; cross-sectional	27 children undergoing liver transplantation at King's College Hospital (mean age 7 years) and 27 healthy children from the Greenwich Health District, South East	Liver disease requiring liver transplantation	Mean dmft and DMFT were 2.28 and 0.79 respectively in liver transplant patients, and 1.22 and 0.9 respectively in controls. No significant difference in % of caries-free children between liver transplant children (59.3%) and control children (51.9%). No differences for any of the indices assessed and their components except for the mean

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
			London (mean age 8 years)		number of missing primary tooth surfaces, which was significantly higher in transplant children (6.08) compared to controls (0)(p<0.03).
Turner et al. 2008 (199)	Prevalence of fillings; untreated decay	Observational; cross-sectional	1,021 individuals with learning disabilities participating in the 2005 Glasgow Special Olympics (SO); mean age 28 years	Learning disability	Compared with results from the 1998 ADHS, SO participants were significantly more likely to be free from fillings in every age group analysed. SO participants were significantly more likely to be free from untreated caries in the 16-24 and 25-34 age groups (both p<0.001).
Watson et al. 2010 (200)	DMFT	Observational; cross-sectional	100 adults with visual impairment attending the Low Vision Aid clinic at Moorfields Eye Hospital, London; 54% of sample aged 75 years or over	Visual impairment	In bivariate analysis, no significant difference in mean number of decayed and untreated teeth, or in mean number of restored and sound teeth between the 1998 ADHS (only South of England) and the study sample.
Periodontal disease					
Ahluwalia et al. 2004 (189)	Plaque score; gingival index	Observational; cross-sectional	81 children with cleft palate attending craniofacial clinics and 61 control children attending a dental trauma clinic in London; mean age 10.5 years	Cleft palate	Children with cleft palate had significantly higher plaque scores (p<0.001), and significantly greater gingival index scores (p<0.001) than the control children.

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
Cumella et al. 2000 (193)	Gingivitis status	Observational cross-sectional	50 adults with learning disabilities from North Warwickshire Special Needs Register	Learning disability	35% of the sample had healthy gingival conditions, 40% had a gingival condition reversible with tooth-brushing. 25% required clinical treatment.
Lucas et al. 2000 (195)	Plaque; Gingivitis	Observational; cross-sectional	60 children (aged 3 to 15 years) attending the Cleft Clinic at Great Ormond Street Hospital and 60 control children from the Trauma Clinic and Children's Dentistry at Guy's Hospital, London	Cleft palate	Groups were matched for age, sex, ethnicity and social class. No significant differences between the two groups in plaque or gingival scores in either the primary and permanent dentition.
Percival et al. 2009 (196)	Plaque score; plaque index; gingivitis score; gingivitis index	Observational; cross-sectional	39 children with intractable epilepsy attending the UK National Centre For Young People with Epilepsy, and 39 healthy children from local schools in Surrey	Epilepsy	For permanent dentition, mean plaque scores were significantly greater in children with epilepsy (68) compared with controls (42). Similarly, mean gingivitis scores were higher for epileptic children (47.9) compared with control children (15.8). No significant differences found for primary dentition regarding periodontal disease.
Sheehy et al. 2000 (198)	Plaque index; gingivitis index; gingival overgrowth	Observational; cross-sectional and pre-post analysis.	27 children undergoing liver transplantation at King's College Hospital (mean age 7 years) and 27 healthy children from the Greenwich Health	Liver disease requiring liver transplantation	No significant differences between the two groups for either mean plaque or gingivitis indices.

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
			District, South East London (mean age 8 years)		
Turner et al. 2008 (199)	Presence of plaque; gingivitis	Observational; cross-sectional	1,021 individuals with learning disabilities participating in the 2005 Glasgow Special Olympics (SO); mean age 28 years	Learning disability	Plaque levels in sample: 10% heavy and 37% moderate. Overall prevalence of gingivitis was 63%.
Dental Trauma					
Percival et al. 2009 (196)	Dental trauma	Observational; cross-sectional	78 children aged 4 to 16 years. 39 with intractable epilepsy from UK National Centre For Young People with Epilepsy and 39 healthy children from local schools in Surrey	Epilepsy	54% of the epileptic children had experienced dental trauma to the anterior teeth compared with 12.5% of the control children ($p<0.0001$). There was a significantly higher number of children in the epilepsy group with fractured maxillary left (n=16) and right (n=10) central incisors compared with the control children (n=1 and n=1 respectively).
Tooth loss					
Baird et al. 2007 (201)	Edentulism	Observational; cross-sectional	289 adults with multiple sclerosis identified from local health authority records in Leicestershire; mean age 51.5 years	Multiple sclerosis	8% of patients with multiple sclerosis were edentulous compared with 13% in the general population.

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
Cumella et al. 2000 (193)	Number of teeth	Observational cross-sectional	50 adults with learning disabilities from North Warwickshire Special Needs Register	Learning disability	78% of subjects were dentate. 48% had 21 or more teeth. Mean number of teeth for dentate participants was 10.6.
Djemal et al. 2016 (202)	Number of teeth	Observational; cross-sectional	200 renal dialysis patients attending the renal unit at King's College Hospital; mean age 62 years	Kidney disease requiring renal dialysis	Results were compared with data from the London residents in the 2009 ADHS. Significantly more renal dialysis patients were edentulous and those who were dentate had fewer teeth than the ADHS 2009 participants (both p<0.0001).
McCreadie et al. 2004 (203)	Number of teeth; total tooth loss	Observational; cross-sectional	428 outpatients with schizophrenia (mean age 43 years), from six different areas in the UK	Schizophrenia	Compared to the 1998 ADHS, there was no significant difference in prevalence of edentulousness (13% vs 16%). In the younger age groups, significantly more patients than those in the general population reported to be edentate (3-39% vs 1-20%). Fewer outpatients had more than 20 natural teeth, compared to individuals from the ADHS (70% vs 83%) (p<0.001).
Turner et al. 2008 (199)	Number of teeth; total tooth loss	Observational; cross-sectional	1,021 individuals with learning disabilities participating in the 2005 Glasgow Special Olympics (SO); mean age 28 years	Learning disability	No significant differences in total tooth loss between sample and adults in 1998 ADHS. Number of teeth: among the 35-44 age group, 78% of SO participants had 21 or more teeth compared to 93% in the ADHS (p<0.001). In the 45-54 age group, 48% of SO participants had 21 or more teeth compared to 77% in the general population (p<0.001).
Watson et al. 2010 (200)	Number of teeth; total tooth loss	Observational; cross-sectional	100 adults with visual impairment attending the Low Vision Aid clinic at	Visual impairment	Results were compared with 1998 ADHS Southern England.

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
			Moorfields Eye Hospital, London; 54% of sample aged 75 years or over		In bivariate analysis, no significant differences found for number of teeth. For edentulism: 9.3% of the ADHS sample were edentulous compared to 5.7% of adults with visual impairment.

Table S4.2 Disability and subjective oral health / Oral Health Related Quality of Life

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
Subjective or perceived oral health					
McCreadie et al. 2004 (203)	Satisfaction with appearance; dental pain; perceived treatment need	Observational; cross-sectional	428 outpatients with schizophrenia (mean age 43 years), from six areas in the UK; further analysis conducted in 93 patients in Nithsdale, Scotland	Schizophrenia	78% of Nithsdale patients were happy with the appearance of their teeth; 9% currently had oral pain or toothache; 17% had biting problems; 25% had bleeding gums when brushing; and 25% thought they needed treatment. None of these significantly different from Scottish general population (1993 Scottish Survey).
Watson et al. 2010 (200)	Perceived treatment need	Observational; cross-sectional	100 adults with visual impairment attending the Low Vision Aid clinic at Moorfields Eye Hospital, London; 54% of sample aged 75 years or over	Visual impairment	Results were compared with 1998 ADHS Southern England. No significant differences found for treatment need outcomes, except for 'don't need treatment': subjects with a visual impairment were more likely to report this than the ADHS group (82% vs 46% respectively).
Oral Health Related Quality of Life (OHRQoL)					
Hunter et al. 2006 (204)	OHIP-14	Observational; cross-sectional	41 patients (mean age 69 years), from Tayside, Scotland, one year after suffering a stroke	Disability after stroke	40% of participants experienced moderate disability or greater after their stroke. The more frequently reported OHIP-14 items were having trouble pronouncing words (32%) and feeling self-conscious (29%). 25% of all participants had a worsened sense of taste occasionally or more frequently in the year since suffering their stroke. A smaller proportion of

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
					stroke patients experienced pain compared to the 1998 ADHS, possibly related to loss of sensation.

Table S4.3 Disability and oral health related behaviours

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
Oral hygiene					
Ahluwalia et al. 2004 (189)	Oral Hygiene Index	Observational; cross-sectional	81 children with cleft palate attending craniofacial clinics and 61 control children attending a dental trauma clinic in London; mean age 10.5 years	Cleft palate	Children with cleft palates had significantly poorer oral hygiene scores than children from the control group ($p<0.001$).
Baird et al. 2007 (201)	Tooth brushing frequency	Observational; cross-sectional	289 adults with multiple sclerosis identified from local health authority records in Leicestershire; mean age 51.5 years	Multiple sclerosis	97% of individuals reported cleaning their teeth regularly. Of those, 34% said they brushed once (34%), and 66% said they brushed twice or more per day.
Djemal et al. 2016 (202)	Oral hygiene practices	Observational; cross-sectional	200 renal dialysis patients attending the renal unit at King's College Hospital; mean age 62 years	Kidney disease requiring renal dialysis	Results were compared with data from the London residents of the 2009 ADHS. 72% of the sample brushed their teeth twice or more. No significant difference between the groups for frequency of toothbrushing. Electric toothbrush use and dental floss were significantly higher in the dentate ADHS group, whereas mouthwash

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
					use was significantly higher in the dentate renal dialysis group.
Eldridge and Gallagher 2000 (194)	Oral hygiene habits	Observational; cross-sectional	20 paediatric (mean age 5.8 years) HIV-infected outpatients attending a South London hospital	HIV	All 20 children had started having their teeth brushed, however a majority (12) begun using toothpaste only after their 2nd birthday. 80% of them were reported to use fluoride toothpaste. Two children had taken fluoridate supplements.
Hunter et al. 2006 (204)	Tooth cleaning frequency; difficulty cleaning teeth	Observational; cross-sectional	41 patients (mean age 69 years), from Tayside, Scotland, one year after suffering a stroke	Disability after stroke	40% of participants experienced moderate or severe disability after their stroke. 21 subjects reported cleaning their teeth once a day and 13 twice daily. 37% had difficulty with tooth cleaning. Difficulty cleaning teeth was associated with the degree of disability (p=0.015): two-thirds (four of six) with moderate to severe disability had difficulty cleaning their teeth.
McCreadie et al. 2004 (203)	Tooth brushing frequency	Observational; cross-sectional	428 outpatients with schizophrenia (mean age 43 years), from six different areas in the UK; further analysis conducted in 93 patients in Nithsdale, Scotland	Schizophrenia	Compared to the Scottish general population (1993 Scottish Survey), fewer patients in Nithsdale reported brushing daily (96% vs 50%) (p<0.001).
Stanfield et al. 2003 (205)	Oral hygiene habits	Observational; cross-sectional	106 adults with mild learning disabilities (mean age 53 years), who were residents in a long stay hospital and	Learning disability	53% patients relied upon the care staff to clean their teeth, 36% cleaned their own teeth, and 11% shared the responsibility with care staff. 90% of

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
			who had been resettled into the community between 1995 and 1998		patients were reported to use fluoride toothpaste, 30% to use mouthwashes regularly.
Watson et al. 2010 (200)	Tooth brushing frequency; use of mouthwash; use of floss	Observational; cross-sectional	100 adults with visual impairment attending the Low Vision Aid clinic at Moorfields Eye Hospital, London; 54% of sample aged 75 years or over	Visual impairment	Results were compared with 1998 ADHS Southern England. 96% of study participants brushed their teeth at least twice daily compared to 70% in the 1998 ADHS. The group with a visual impairment was also significantly more likely to use mouthwash and dental floss (88% and 49%, respectively) compared with ADHS (52% and 25%, respectively).
Sugar intake					
Eldridge & Gallagher 2000 (194)	Sugar intake frequency	Observational; cross-sectional	20 paediatric (mean age 5.8 years) HIV-infected outpatients attending a South London hospital	HIV	10 parents reported that their children consumed sugars more than once a day and 16 children were reported to have sugary snacks or drinks on most days of the week.

Table S4.4 Disability and service use

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
Service use					
Baird et al. 2007 (201)	Dental attendance	Observational; cross-sectional	289 adults with multiple sclerosis (MS) identified from local health authority records in Leicestershire; mean age 51.5 years	Multiple sclerosis (MS)	Compared to the general population, adults with MS were more frequently: registered with a dentist (88% vs 49%), reporting attendance in the past year (81% vs 71%) and attending for check-ups (70% vs 59%).
Champion and Holt 2000 (206)	Dental attendance; communication with dentist	Observational; cross-sectional	84 hearing impaired children residing in the UK, contacted through the National Deaf Children' Society	Hearing loss	82 children had visited a dentist. 63% were reported to have at least one problem in communication while receiving dental care. This increased significantly as the severity of the hearing impairment increased ($p<0.05$).
Cumella et al. 2000 (193)	Dental attendance; access to dentist	Observational cross-sectional	50 adults with learning disabilities from the North Warwickshire Special Needs Register	Learning disability	66% of the participants (or their carers) claimed to have visited the dentist within the previous 12 months. Four carers reported having problems in accessing dental care.
Eldridge & Gallagher 2000 (194)	Dental attendance	Observational cross-sectional	30 paediatric (mean age 5.8 years) HIV-infected outpatients attending a South London hospital	HIV	15 children had been examined by a dentist. Of those, 53% of parents disclosed their child's medical history to the dentist.
Djemal et al. 2016 (202)	Dental attendance	Observational; cross-sectional	200 renal dialysis patients attending the renal unit at King's College Hospital; mean age 62 years	Kidney disease requiring renal dialysis	Results compared to data from London residents in 2009 ADHS (age- and sex-matched). No significant difference between the groups for dental visits within last 12

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
					months. 55% of dentate study participants visited the dentist for regular check-ups compared to 61% in the ADHS; 36% only attended if they had a problem compared to 25% in the ADHS. 8% of dentate participants reported never having been to the dentist, compared to 4% in the ADHS 2009.
Hunter et al. 2006 (204)	Dental attendance	Observational; cross-sectional	41 patients (mean age 69 years), from Tayside, Scotland, one year after suffering a stroke	Disability after stroke	Before stroke, 16 subjects reported to have attended the dentist regularly. 21 visited the dentist only when in trouble. 25 adults reported that they would continue to attend as they did before stroke. 2/3 of those giving a reason for attending less often in the future stated a reason related to their stroke disability.
Lawrence et al. 2013 (207)	Registration with dentist; last time of dental visit	Observational; cross-sectional	71 patients with head and neck cancer (excluding malignancies of the brain, thyroid and lymphomas) who were to have radiotherapy in a hospital of Lincolnshire, UK	Head and neck cancer	49 patients were registered with a dentist. 37 reported they had not been reviewed by a dentist within the past 12 months before radiotherapy.
McCreadie et al. 2004 (203)	Dental attendance	Observational; cross-sectional	428 outpatients with schizophrenia (mean age 43 years), from 6 different areas in the UK; further analysis conducted in 93	Schizophrenia	Compared to the Scottish general population (1993 Scottish Survey), more patients in Nithsdale had last visited the dentist because of trouble with their teeth 61% vs 32%); and fewer had visited for a check-up (33% vs 49%).

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
			patients in Nithsdale, Scotland		
Rodd et al. 2007 (208)	Frequency of missed dental appointments	Observational; retrospective	45 cleft and 45 non-cleft children with dental appointments (from April 2003 to March 2004) in cleft clinics and paediatric clinics in a hospital in the UK, mean age= 8.8 years	Cleft palate	Cleft palate patients missed a significantly greater proportion of their paediatric dental appointments than non-cleft children (22.4% vs 11.9%). Patients with a bilateral cleft were significantly more likely to miss an appointment than patients with a unilateral cleft type (47.9% vs 16.7%). Age, gender, medical history, and distance travelled had no significant effect on attendance rates.
Stanfield et al. 2003 (205)	Dental service use	Observational; retrospective	106 adults with mild learning disabilities (mean age 53 years), who were residents in a long stay hospital and who had been resettled into the community between 1995 and 1998	Learning disability	Significant fewer patients had been examined by a dentist within last 6 months whilst in the community (57%) compared with a similar period of hospital residency (73%). Once living in the community 31 subjects (29%) had been seen by a dentist at home, 23 (26%) in a health centre-based dental surgery, 20 (22%) in a general dental practice, 12 (14%) in a district general hospital, 2 (2%) in a hospital and 1 (1%) in a day centre.
Watson et al. 2010 (200)	Dental attendance	Observational; cross-sectional	100 adults with visual impairment attending the Low Vision Aid clinic at Moorfields Eye Hospital,	Visual impairment	Results were compared with 1998 ADHS Southern England. Adults with a visual impairment were significantly less likely to have accessed private dental care than people from the ADHS sample

Author and year	Outcomes	Study design	Study population	Type of disability	Key findings
			London; 54% of sample aged 75 years or over		(6% vs 25%). No significant difference found for accessing NHS or other dental care types between the groups. Compared with the ADHS sample, subjects from this study were significantly less likely to attend for regular check-ups (37% vs 54%). Visually impaired individuals were significantly more likely to attend a dentist only when in trouble (59%) than the comparison group (24%).

Table S5.1 Clinical outcomes (periodontal disease, tooth loss) during pregnancy or maternity

Author and year	Outcomes	Study design	Study population	Key findings
Periodontal disease				
Dashash et al. 2008 (209)	Bleeding on probing	Pilot prospective cohort study	145 pregnant women recruited from St Mary's Hospital, Manchester	Study examined relationship between maternal periodontal disease and adverse birth outcomes. 48% of the sample had bleeding on probing in > 50% of the sites examined.
Hullah et al. 2008 (76)	Problems with gums during pregnancy (yes/no)	Observational cross-sectional	Convenience sample of 206 women at a North London Hospital; mean age 28.2 years	44% of women reported gum problems during pregnancy.
Moore et al. 2001 (15)	Plaque and bleeding scores, pocket depth and loss of attachment	Observational cross-sectional	2,027 pregnant women attending Guy's Hospital, mean age 29.8 years	Study compared periodontal outcomes in the sample to those for non-pregnant women who participated in the 1998 ADHS. 65% of the sample had one or more sites with visible plaque, similar to women in the ADHS (71%). Among the study sample 13.9% had one or more deep (≥ 6mm) pockets compared to 2.9% of women in the ADHS. 75.8% of pregnant women had one or more probing depths of ≥ 4mm compared to 48.3% of women in the ADHS.
Moore et al. 2004 (210)	Plaque and bleeding scores; pocket depth; loss of attachment	Prospective cohort study	3,738 pregnant women from Guy's and St Thomas' Hospital Trust, London; mean age 29.9 years	7.4% of all participants were periodontally healthy (defined as having less than 10% of sites with probing depth of ≥ 3mm and less than 5% of sites ≥ 2mm loss of attachment) 7.2% had severe periodontal disease (defined as more than five sites with probing depth of ≥ 5 mm and more than three sites with ≥ 3mm loss of attachment). Study compared findings to those for males and females aged 16 to 44 years in the 1998 ADHS. 65% of the study population had one or more sites with visible plaque, compared to 71% in the ADHS. 12% of pregnant

Author and year	Outcomes	Study design	Study population	Key findings
				women had at least one deep pocket (≥ 6mm) compared with 3% of subjects with pocketing of at least 5.5 mm in the ADHS.
Tooth loss				
Moore et al. 2001 (15)	Number of teeth	Observational cross-sectional	2,027 pregnant women attending Guy's Hospital, mean age 29.8 years	The mean number of teeth among participants was 28.

Table S5.2 Subjective oral health / Oral Health Related Quality of Life during pregnancy or maternity

Author and year	Outcomes	Study design	Study population	Key findings
Subjective or perceived oral health				
Hullah et al. 2008 (76)	Teeth become worse during pregnancy (yes or no)	Observational cross-sectional	Convenience sample of 206 women at a North London Hospital; mean age 28.2 years	36% of the subjects felt that the condition of their teeth had deteriorated during pregnancy. 34% had never experienced dental pain.

Table S5.3 Oral health related behaviours during pregnancy or maternity

Author and year	Outcomes	Study design	Study population	Key findings
Oral hygiene				
Hullah et al. 2008 (76)	Tooth brushing frequency	Observational cross-sectional	Convenience sample of 206 women at a North London Hospital; mean age 28.2 years	73% of the sample reported to brush their teeth more than once a day, 23% reported to brush them once a day and approximately 3% less than daily.

Table S5.4 Service use during pregnancy or maternity

Author and year	Outcomes	Study design	Study population	Key findings
Service use				
Hullah et al. 2008 (76)	Dental attendance	Observational cross-sectional	Convenience sample of 206 women at a North London Hospital; mean age 28.2 years	About one third of women had visited a dentist during pregnancy, half of whom needed and received treatment.
McGrath et al. 2002 (80)	Dental attendance (regular or irregular)	Observational cross-sectional	666 mothers with dependent children (<16 years). Subsample derived from two “omnibus surveys” conducted by ONS	81% of mothers in the sample visited the dentist within the past year. 73% of mothers were regular attenders (visit within last year & reason other than dental emergency).

Table S6.1 Clinical outcomes (dental caries) by religion

Author and year	Outcomes	Study design	Study population and religion groups	Key findings
Dental caries				
Dugmore and Rock 2005 (97)	DMFT, any caries experience	Observational, cross-sectional	238 non-Muslim Asian children and 77 Muslim Asian children, derived from a random sample of 1,753 12 year old children from all schools in Leicestershire and Rutland, England.	Mean DMFT among Non-Muslim Asian children = 0.68; and among Muslin Asian children = 1.14 (p>0.01). Active decay present in 21.0% of Non-Muslim and 35.1% of Muslim Asian children. Any caries experience: 34.5% of Non-Muslim and 49.4% of Muslim Asian children.

Table S7.1 Clinical outcomes (dental caries, odontofenic infections, periodontal disease, tooth loss, oral cancer) among homeless people

Author and year	Outcomes	Study design	Study population	Key findings
Dental caries				
Coles et al. 2011 (211)	D3MFT	Observational, cross-sectional	853 homeless people aged 16-67 years (mean age 33 years; 74% male) from 7 National Health Service Boards in Scotland; accessed through health clinics, hostels, day and night shelters and soup kitchens	Study examined associations between oral health status, dental anxiety and OHRQoL and homeless people's experience of depression. This sample experienced poorer dental health compared with data for the UK general population. Mean D3MFT was 15.87; mean D3 = 4.68, mean M= 7.58; mean F= 3.63; mean DM= 12.26.
Collins and Freeman 2007 (212)	D3cvMFT (cv = cavitation and visual dentine caries)	Observational, cross-sectional	317 homeless people aged 16 to 91 years, (mean age 40 years; 84% male) from North and West Belfast; accessed through hostels for single homeless people and drop-in centres for rough sleepers	The study population had greater numbers of missing teeth, decayed teeth and lower numbers of filled teeth compared with adults in Northern Ireland (NI) who took part in the 1998 Adult Dental Health Survey. In this sample, mean D3cvMFT was 16.2; mean D3cv = 3.5 ; mean M= 7.6; mean F= 5.4.
Daly et al. 2010 (213)	Dental decay requiring treatment	Observational, cross sectional, based on case-note review	201 homeless people (180 men, 24 women); mean age 39 years; who used a targeted dental service in 3 South East London boroughs between 1992 and 2001	Sample had higher levels of normative dental need compared to their equivalent age group in the general population. 71% of the sample required treatment for dental decay (including decayed and recurrent decayed teeth); and 8% of participants required treatment for root surface decay.

Author and year	Outcomes	Study design	Study population	Key findings
				Total restorative need (including decayed, recurrent decayed teeth, and root lesions) = 71%.
Daly et al. 2010 (214)	D3MFT	Observational, cross-sectional	97 homeless people from 8 facilities catering for homeless people in South East London; mean age 40 years; 92% male	Homeless people in the sample had more decayed teeth and fewer filled teeth compared with the general population. 67% of the sample had active decay (25% had more than 5 decayed teeth, compared to 3% among the general population). 76% had a restorative need (including decayed, recurrent decayed and root lesions). Mean DMFT of dentate participants (n=94) was 15.5; mean DT=4.2; mean MT= 6.8; mean FT= 4.6.
Waplington et al. 2000 (215)	DMFT	Observational, cross-sectional	70 homeless people with mental health problems living in a hostel in Birmingham; mean age 55 years; 44% female	The mean DMFT among dentate participants was 15.9; these had a mean 3.6 decayed teeth. Missing teeth constituted the largest component of DMFT in the sample. Prevalence of root and coronal caries among dentate individuals (n=48), was 52% and 73% respectively.
Odontogenic infections				
Waplington et al. 2000 (215)	Obvious pulpal involvement	Observational, cross-sectional	70 homeless people with mental health problems living in a hostel in Birmingham; mean age 55 years; 44% female	54% of the sample had one or more teeth with obvious pulpal involvement.
Periodontal disease				
Collins and Freeman 2007 (212)	Community Periodontal Index	Observational, cross-sectional	282 homeless people aged 16 to 91 years, (mean age 40 years; 84% male) from	Study population had higher levels of periodontal disease compared with NI adults in the 1998 Adult Dental Health Survey. Only 8% of participants had no obvious gingival or periodontal

Author and year	Outcomes	Study design	Study population	Key findings
			North and West Belfast; accessed through hostels and drop-in centres for rough sleepers	disease. 75% had bleeding gums and calculus; 4% had pocket depths of 6mm or more. Mean CPI score was 1.9 (95%CI: 1.8, 2.0).
Daly et al. 2010 (213)	Periodontal disease requiring treatment	Observational, cross sectional, based on case-note review	201 homeless people (180 men, 24 women); mean age 39 years; who used a targeted dental service in 3 South East London boroughs between 1992 and 2001	Most homeless people using the targeted service had higher levels of normative dental need compared to their equivalent age group in the general population. 60% of the sample (123 participants) required treatment for periodontal disease, including gingivitis.
Daly et al. 2010 (214)	Short WHO Community Periodontal Index (CPI)	Observational, cross-sectional	73 homeless people aged 19 to 77 years, from 8 facilities catering for homeless people in South East London; mean age 40 years; 92% male	High prevalence of poor oral hygiene in the sample. Of those examined, 85% had a CPI >0 (presence of debris, bleeding or pocketing). A quarter had debris resulting in bleeding (CPI= 1) and 30% had calculus accumulation (CPI =2). The prevalence of pocketing was 30%. Mean CPI score = 1.9.
Waplington et al. 2000 (215)	Simple presence or absence (indices) of periodontal condition	Observational, cross-sectional	70 homeless people with mental health problems living in a hostel in Birmingham; mean age 55 years; 44% female	Overall poor periodontal health among this sample. Over one third of the sample (half of dentate participants) had excessively mobile teeth and advanced recession in two or more sextants.
Tooth loss				
Daly et al. 2010 (214)	Edentulism (total tooth loss);	Observational, cross-sectional	102 homeless people aged 19 to 77 years, from 8 facilities catering for homeless people	Mean number of teeth present was 25.2. Three participants were edentulous, 18 people relied on dentures and natural teeth; 85% (n=79) had more than 21 remaining teeth.

Author and year	Outcomes	Study design	Study population	Key findings
	number of teeth		in South East London; mean age 40 years; 92% male	
Waplington et al. 2000 (215)	Edentulism (total tooth loss)	Observational, cross-sectional	70 homeless people with mental health problems living in a hostel in Birmingham; mean age 55 years; 44% female	31% of the participants were edentulous. Among these, 68% did not wear dentures.
Oral cancer				
Collins and Freeman 2007 (212)	Soft tissue lesions; squamous cell carcinoma	Observational, cross-sectional	317 homeless people aged 16 to 91 years, (mean age 40 years; 84% male) from North and West Belfast; accessed through hostels for homeless singles and drop-in centres for rough sleepers	5% (n=16) of participants had soft tissue lesions. Two of these were later diagnosed as oral cancer (squamous cell carcinoma). Calculated that being homeless increased the risk of contracting oral cancer by 95 times compared with the general NI population.

Table S7.2 Oral Health Related Quality of Life among homeless people

Author and year	Outcomes	Study design	Study population	Key findings
Oral Health Related Quality of Life (OHRQoL)				
Coles et al. 2011 (211)	Oral Health Impact Profile (OHIP-14)	Observational, cross-sectional	853 homeless people aged 16 to 67 years (mean age 33 years; 74% male) from 7 National Health Service Boards in Scotland; accessed through health clinics, hostels, day and night shelters and soup kitchens	This sample experienced poorer OHRQoL compared with data for the UK general population. Mean OHIP-14 total score was 1.19. Most commonly experienced impacts were psychological discomfort (26% of participants reported feeling self-conscious very often) and psychological disability (24% reported feeling embarrassed about the appearance of their mouth and teeth very often). 12% of participants often found their lives less satisfying because of problems with their mouth and teeth; 12% occasionally experienced pain; 14% experienced discomfort when eating and 9% experienced physical disability.
Collins and Freeman 2007 (212)	Oral Health Impact Profile (OHIP-14)	Observational, cross-sectional	242 homeless people aged 16 to 91 years, (mean age 40 years; 84% male) from North and West Belfast; accessed through hostels for single homeless people and drop-in centres for rough sleepers	The mean score for OHIP-14 was 14.8. Impacts most commonly experienced were discomfort, toothache and difficulty eating meals. 47% of participants felt at least 'occasionally' self-conscious or ashamed about the appearance of their teeth; 13% felt self-conscious 'very often' and 12% felt ashamed 'very often'.
Daly et al. 2010 (214)	Oral Health Impact Profile (OHIP-14)	Observational, cross-sectional	90 dentate homeless people from 8 facilities catering for homeless people in South	This sample had poorer OHRQoL compared with participants in 1998 ADHS: among homeless sample, mean OHIP-14 (total score) was 32.0 compared to 19.0 among ADHS sample. 91% of this sample experienced at least 1 impact,

Author and year	Outcomes	Study design	Study population	Key findings
			East London; mean age 40 years; 92% male	52% experienced 5 impacts or more (mean number of impacts = 5.9. Most common impacts were 'aching in the mouth' (67%) and 'discomfort in eating' (62%). The most common domain impacts were pain (75%), psychological discomfort (61%) and psychological disability (59%). 45% reported embarrassment and 42% reported social disability and handicap.
Richards and Keauffling 2009 (216)	Oral Health Impact Profile (OHIP-14)	Observational, cross-sectional	100 homeless adults using a Healthy Living Centre in Swansea (mean age 36 years; 75 male / 25 female)	Mean OHIP-14 score was 21.8. 38 and 11 participants experienced ≥10 impacts at least 'occasionally' and 'very often', respectively. Most common impacts were toothache, discomfort, ability to relax, and feeling embarrassed for the appearance of their teeth. Most commonly reported domains of impact were physical pain, psychological disability and psychological discomfort.

Table S7.3 Oral health related behaviours among homeless people

Author and year	Outcomes	Study design	Study population	Key findings
Oral hygiene				
Hill and Rimington 2011 (217)	Owning a toothbrush; access to toothpaste; tooth brushing frequency	Observational, cross-sectional	27 adult homeless people aged 23 to 61 years (87% male), living in London, Cardiff, Glasgow and Birmingham; 22 were receiving treatment at a homeless dental clinic and 5 were from a Birmingham homeless shelter	95% of the participants reported that they owned a toothbrush and 91% that they had access to toothpaste. 59% of respondents interviewed at the dental clinics reported that they were brushing their teeth two times a day. At the Birmingham hostel, 20% reported brushing their teeth twice a day.
Sugar consumption				
Sprake et al. 2014 (218)	% energy from non-milk extrinsic sugar (NMES)	Observational, cross-sectional	24 homeless people aged 22 to 58 years, accessing two charitable meal services in Sheffield (20 men and 4 women)	Energy intake was significantly lower than the estimated average requirement (p=0.001). Contribution of non-milk extrinsic sugars to total energy intake was significantly higher than the recommended population average intake (p=0.008).

Table S7.4 Service use among homeless people

Author and year	Outcomes	Study design	Study population	Key findings
Daly et al. 2010 (213)	Patterns of service use	Observational, based on case-note review	201 homeless people (180 men, 24 women); mean age 39 years; who used a targeted dental service in 3 South East London boroughs between 1992 and 2001	Before visiting the targeted dental service only 4% (n=9) of sample were registered with a GDP. For 153 participants, all first contacts were made at outreach clinics. 40% attended because of oral pain, 28% for dental check-up and oral prophylaxis. 51% of participants returned for further treatment. 68% of 204 patients did not have their course of treatment completed.
Hill and Rimington 2011 (217)	Patterns of service use	Observational, cross-sectional	27 adult homeless people aged 23 to 61 years (87% male), living in London, Cardiff, Glasgow and Birmingham; 22 were receiving treatment at a homeless dental clinic and 5 were from a Birmingham homeless shelter	22 participants received treatment at a homeless dental clinic. Main reasons for attending were pain (94%), missing teeth (41%), swelling (12%) and periodontal conditions (18%). 45% of participants reported to attend only when in pain. Main reasons for non-attendance were cost, low priority and fear. Only 23% of the participants were registered with a GDP. None had used hospital emergency services. All knew where they could obtain care if in pain. Staff identified negative attitudes of dental professionals towards homeless people (for example, reports of aggression and cross infection). Only half of patients attended for follow up treatments. Majority of treatments were extractions and dentures. 85% of dental staff stated that accessing dental care is difficult for homeless patients.
Simons et al. 2012 (219)	Patterns of service use	Audit: data from random sample of patient records	Records of 349 homeless patients aged 18 to 74 years (mean age 38 years), attending Community Dental	99% of sampled patients required treatment. 40% of patients presented with pain. 61% had completed their treatment which took between 1 to 18 appointments (only 28% without any failed or cancelled appointments).

Author and year	Outcomes	Study design	Study population	Key findings
			Services in East London between April 2009 to September 2011	37% were lost after first appointment, the majority of these patients received treatment for pain with temporary fillings, extractions, permanent fillings and management of swellings.
Waplington et al. 2000 (215)	Patterns of service use; barriers to accessing dental care	Observational, cross-sectional	70 homeless people with mental health problems living in a hostel in Birmingham; mean age 55 years; 44% female	For 55% of participants, it was estimated that treatment would be limited to a simple treatment without general anaesthesia or sedation. A lack of perceived need and fatalism was evident in this group. Fear about dental treatment and cost were cited as barriers to dental treatment. With regard to receiving dental care on a mobile service, participants were generally cautious.

Table S8.1 Clinical outcomes (dental caries, odontogenic infection, periodontal disease) among prisoners

Author and year	Outcomes	Study design	Study population	Key findings
Dental caries				
Heidari et al. 2007 (220)	DMFT	Observational, cross-sectional	Convenience sample of 78 remand prisoners (HMP Brixton); mean age 35.7 years	Compared to 1998 ADHS, prisoners had more decayed, fewer sound, fewer filled, and fewer missing teeth. Sample mean for DMFT was 13.8 compared to 16.3 in the ADHS. For the decayed component, prisoners had a mean of 3.5 decayed teeth compared to a mean of 1 decayed tooth among the general population.
Heidari et al. 2008 (221)	DMFT	Observational, cross-sectional	Convenience sample of 122 prisoners (HMP Brixton); mean age 36.4 years	Dental examination included 28 teeth. Mean DMFT was 13.8 (7.3). Mean for decayed teeth = 3.6; missing teeth = 5.7 and filled teeth mean = 4.6. The mean DMFT was 14.2 and 13.2 for remand and convicted prisoners, respectively.
Jones et al. 2005 (222)	DMFT	Observational, cross-sectional	Random sample of 316 prisoners (n=272 examined) in the North West of England	Prisoners had fewer filled teeth and more decayed and unsound teeth than results shown in 1998 ADHS. Mean number of decayed/unsound teeth for male prisoners was 4.2; while for English males in the ADHS it was 1.7. Female prisoners had a mean of 4.6 decayed/unsound teeth, compared to 1.2 among English females in the ADHS.
Lunn et al. 2003 (223)	DMFT	Observational, cross-sectional	Convenience sample of 127 prisoners (HMP Winchester), aged 18 to 30 years	Mean DMFT was 14.35. The sample mean for the decayed component was 3.8; missing teeth 6.3 and filled teeth 4.2. 70% of the decayed teeth were found in 40% of the individuals. Only 10 subjects were free from active decay.
Marshman et al. 2014 (224)	Number of decayed teeth	Observational, cross-sectional	700 male prisoners attending HMP Doncaster, Lindholme or Moorland; mean age 28.9 years	Study focused on assessing the relation between dental indifference and OHRQoL using a behavioural model. The mean number of decayed teeth in the sample was 2.87(4.0).

Author and year	Outcomes	Study design	Study population	Key findings
Rouxel et al. 2013 (225)	DMFT	Observational, cross-sectional	Random sample of 103 female prisoners (HMP Holloway), mean age 30.9 years	Mean DMFT score for prisoners was 12.3 compared to 11.4 in the 2009 ADHS. A mean of 2.5 teeth were decayed - twice the level found in the ADHS (1.0 ± 2.0). 75% of participants had decayed teeth compared to 39% in the ADHS.
Periodontal disease				
Heidari et al. 2007 (220)	Bleeding on probing; probing depth; visible plaque	Observational, cross-sectional	Convenience sample of 78 remand prisoners (HMP Brixton); mean age 35.7 years	The mean number of bleeding sites was 25; mean number of sites with visible plaque = 44. The mean number of sites with pocket depths of 4-6mm was 39; and of pocket depths of > 6 mm was 2.5 (±3).
Heidari et al. 2008 (221)	Periodontal pocket depth	Observational, cross-sectional	Convenience sample of 122 remand and convicted prisoners (HMP Brixton); mean age 36.4 years	The mean probing depth (mm) was 3.4 for the whole sample and 3.4 and 3.3 for remand and convicted prisoners, respectively. The mean number of sites with pocket depths of >4mm was 44.7 and mean number of sites with pockets of >6mm: 6.1.
Rouxel et al. 2013 (225)	Bleeding on probing; periodontal pocket depth; calculus	Observational, cross-sectional	Random sample of 103 female prisoners (HMP Holloway), mean age 30.9 years	96% of the sample had gingival bleeding at probing compared to 55% of adult females in the 2009 AHDS. 60% of prisoners had periodontal pocketing of >4mm compared with 41% in the ADHS. Prevalence of pockets of >6mm 40% among prisoners vs. 7% in the ADHS. 82% of prisoners had some calculus compared to 69% in the ADHS.
Odontogenic infection				
Rouxel et al. 2013 (225)	PUFA index	Observational, cross-sectional	Random sample of 103 female prisoners (HMP Holloway), mean age 30.9 years	Prevalence of PUFA score of one or more = 40%, more than five times higher than the 2009 ADHS (7%). More than 20% had a PUFA score of two or more. The mean PUFA-index score was 0.8, vs. 0.11 in the ADHS. The main PUFA component was pulpal involvement (39%).

Table S8.2 Subjective oral health and Oral Health Related Quality of Life among prisoners

Author and year	Outcomes	Study design	Study population	Key findings
Subjective or perceived oral health				
Heidari et al. 2007 (220)	Perceived oral health needs	Observational, cross-sectional	Convenience sample of 78 remand prisoners (HMP Brixton); mean age 35.7 years	71% of the sample perceived their oral health as poor and as requiring treatment. 19% felt that they had a healthy mouth and 9% were unclear about their oral health status.
Heidari et al. 2008 (221)	Perceived oral health needs	Observational, cross-sectional	Convenience sample of 122 remand and convicted prisoners (HMP Brixton); mean age 36.4 years	86 (71%) subjects perceived their oral health as poor. 22 (18%) reported having a healthy oral condition and 13 (11%) were uncertain about their oral health status. Dry mouth was reported by 39(32%) prisoners.
Marshman et al. 2014 (224)	Satisfaction with appearance of teeth; perceived treatment need; self-rated oral health	Observational, cross-sectional	Sample of 700 male prisoners attending HMP Doncaster, Lindholme or Moorland, mean age 28.9 years	Study focused on assessing the relation between dental indifference and OHRQoL using a behavioural model. 454 (69%) subjects were not satisfied with their teeth. Most prisoners (75%) perceived they needed dental treatment and 38% of the sample rated their oral health as poor.
Oral Health Related Quality of Life (OHRQoL)				
Marshman et al. 2014 (224)	Oral Health Impact profile (OHIP-14)	Observational, cross-sectional	Sample of 700 male prisoners attending HMP Doncaster, Lindholme or Moorland, mean age 28.9 years	Study focused on assessing the relation between dental indifference and OHRQoL using a behavioural model. The mean OHIP-14 score was 17.8 (range 0 to 60, SD=12.1) with 94.1% experiencing one or more oral impacts on their life, whilst in the 2009 ADHS 39% of 25 to 34 year olds had at least one oral impact.

Author and year	Outcomes	Study design	Study population	Key findings
Rouxel et al. 2013 (225)	OIDP index	Observational, cross-sectional	Random sample of 103 female prisoners (HMP Holloway), mean age 30.9 years	Oral impacts (at least one impact) were over two times more prevalent in the sample (73%) than in the 2009 ADHS (34%). Most common impacts were on eating (55%), smiling (37%), emotional stability (32%) and relaxing (30%). In the ADHS, the most affected items were eating (21%), cleaning teeth (16%) and smiling (16%).

Table S8.3 Oral health related behaviours among prisoners

Author and year	Outcomes	Study design	Study population	Key findings
Oral hygiene				
Heidari et al. 2007 (220)	Tooth brushing frequency	Observational, cross-sectional	Convenience sample of 78 remand prisoners (HMP Brixton); mean age 35.7 years	70% of the sample reported brushing their teeth twice per day.
Heidari et al. 2008 (221)	Tooth brushing frequency	Observational, cross-sectional	Convenience sample of 122 remand and convicted prisoners (HMP Brixton); mean age 36.4 years	70% reported brushing their teeth twice daily.
Rouxel et al. 2013 (225)	Tooth brushing frequency;	Observational, cross-sectional	Random sample of 103 female prisoners (HMP Holloway), mean age 30.9 years	82% of prisoners reported brushing their teeth twice a day compared to 77% of respondents in the 2009 ADHS. 3% of prisoners and 2% of the ADHS sample reported brushing less than once a day.

Author and year	Outcomes	Study design	Study population	Key findings
Sugar consumption				
Heidari et al. 2007 (220)	Sugar intake per day	Observational, cross-sectional	Convenience sample of 78 remand prisoners (HMP Brixton); mean age 35.7 years	The mean number of sugar intakes per day was 9.8.
Heidari et al. 2008 (221)	Sugar intake per day; reasons for sugar intake	Observational, cross-sectional	Convenience sample of 122 remand and convicted prisoners (HMP Brixton); mean age 36.4 years	Prisoners had a mean of 9.8 sugar intakes per day.
Rouxel et al. 2013 (225)	Sugar intake	Observational, cross-sectional	Random sample of 103 female prisoners (HMP Holloway), mean age 30.9 years	66% of the participants had a high sugar intake in comparison with 46% of the 2009 ADHS sample.

Table S8.4 Service use among prisoners

Author and year	Outcomes	Study design	Study population	Key findings
Heidari et al. 2007 (220)	Last time visited the dentist; reason for last visit; type of service used	Observational, cross-sectional	Convenience sample of 78 remand prisoners (HMP Brixton); mean age 35.7 years	73% of prisoners reported to have visited the dentist during the last year. As reason for last dental visit, 67% reported they visited the dentist due to pain, swelling, infection or trauma, 12% for a check-up and 12% for routine treatments. 54% of the sample reported to have had their most recent dental visit in prison. 32% reported having used NHS services, 6% private dental care and 5% hospital clinics.

Author and year	Outcomes	Study design	Study population	Key findings
Heidari et al. 2008 (221)	Last time visited the dentist; reason for last visit; type of service used	Observational, cross-sectional	Convenience sample of 122 remand and convicted prisoners (HMP Brixton); mean age 36.4 years	24% of the sample reported never having visited the dentist. Most prisoners (69%) claimed they had visited the dentist during the last year. 52% of those who had visited the dentist before reported using emergency care and 35% routine care. Regarding of type of service used, prisoners' most recent dental visits were mostly to the prison dental service (61%), NHS dental services (29%), private dental clinics and hospital (4%).
Marshman et al. 2014 (224)	Dental attendance before prison; use of prison dental services	Observational, cross-sectional	Sample of 700 male prisoners attending HMP Doncaster, Lindholme or Moorland, mean age was 28.9 years	Before prison: 63.4% of the sample reported visiting a dentist only when having problems, 20.8% reported attending for occasional examinations and 15.8% for regular check-ups. In prison: Most subjects (57.2%) stated that they had not used the prison dental services.
Rouxel et al. 2013 (225)	Usual reason for dental attendance	Observational, cross-sectional	Random sample of 103 female prisoners (HMP Holloway), mean age 30.9 years	33% of the sample reported to visit the dentist regularly compared to 67% in the 2009 ADHS. 41% claimed that their main reason for visiting a dentist was "only in trouble" whilst 22% of the 2009 AHDS reported this.

Table S9.1 Clinical outcomes (dental caries) among travellers

Author and year	Outcomes	Study design	Study population	Key findings
Doughty et al. 2016 (226)	Obvious caries experience	Observational, cross-sectional (pilot study)	37 traveller children based in Hackney, East London, aged 1 to 16 years	66% of children had obvious visual caries.

Table S9.2 Oral health related behaviours among travellers

Author and year	Outcomes	Study design	Study population	Key findings
Oral hygiene				
Doughty et al. 2016 (226)	Tooth brushing frequency (twice; less than twice daily)	Observational, cross-sectional (pilot study)	37 traveller children based in Hackney, East London, aged 1 to 16 years	40% of children reported brushing their teeth twice a day and 60% once per day or less. 53% of children aged 7 years or under were supervised by a parent when brushing teeth.
Sugar Consumption				
Doughty et al. 2016 (226)	Sugar intake	Observational, cross-sectional (pilot study)	37 traveller children based in Hackney, East London, aged 1 to 16 years	95% of children had a moderate to highly cariogenic diet.

Table S9.3 Service use among travellers

Author and year	Outcomes	Study design	Study population	Key findings
Doughty et al. 2016 (226)	Time since last visit; reason for dental visit	Observational, cross-sectional (pilot study)	37 traveller children based in Hackney, East London, aged 1 to 16 years	85% of the children reported have seen a dentist within the last 2 years for routine examination.

Table S10.1 Clinical outcomes (dental caries, dental trauma) among looked-after children

Author and year	Outcomes	Study design	Study population	Key findings
Dental caries				
Keene et al 2015 (227)	dmft and DMFT; Caries-free children; Care-index	Cross-sectional observational	79 children subject to a child protection plan and 79 control children attending paediatric outpatient orthopaedic or general surgery clinics in Bradford; age 2-11 years	For dmft, after adjusting for area deprivation and sex, incidence rate higher in children subject to a protection plan (IRR= 1.76, 95% CI:1.44-2.15) compared to control children. No significant difference between the groups for DMFT. 42% of children with a protection plan were caries free compared to 68% of the control group (p<0.001). The care-index was significantly lower (p=0.008) in children with a protection plan (1.69%) than control group children (6.02%).
Sarri et al 2012 (228)	Dental caries experience	Cross-sectional observational	965 pupils aged 15 to 16 years attending secondary schools in three boroughs of North East London	Study focused on dental neglect. 32 (3.3%) adolescents were classified as “looked-after”. 51.7 % of them experienced dental caries compared to 41.3% of pupils living in families.
Dental Trauma				
Sarri et al 2012 (228)	Dental caries experience	Cross-sectional observational	965 pupils aged 15 to 16 years attending secondary schools in three boroughs of North East London	Study focused on dental neglect. 32 (3.3%) adolescents were classified as “looked-after”. 10% of them experienced traumatic dental injuries compared to 4.5% of the pupils living in families.

Table S10.2 Subjective oral health / Oral Health Related Quality of Life among looked-after children

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
Dental Pain				
Sarri et al 2012 (228)	Dental pain	Cross-sectional observational	965 pupils aged 15 to16 years attending secondary schools in three boroughs of North East London	Study focused on dental neglect. 32 (3.3%) adolescents were classified as 'looked-after'. 12.5% of them experienced dental pain compared to 7% of the pupils living in families.

Table S10.3 Service use among looked-after children

Author and year	Outcomes	Study design	Study population and ethnicity groups	Key findings
Keene et al 2015 (227)	Having own dentist; dental visit in last 12 month	Cross-sectional observational	79 children subject to a child protection plan and 79 control children attending paediatric outpatient orthopaedic or general surgery clinics in Bradford; age 2-11 years	21 children with a protection plan had their own dentist compared to 59 from the control group ($p<0.001$). 30 children with child protection plans had visited a dentist in the last year in comparison with 55 children from the control group ($p<0.001$).
Williams et al. 2001 (229)	Regular dental attendance; treatment need	Case-control study	142 children aged 5 to 16 years in local authority care, and 119 controls matched by age and sex; Wales	Among looked after children, fewer reported to visit a dentist regularly compared to controls. Looked after children were significantly more likely to need treatment when they visited the dentist than control children.

References

1. Aldossary A, Harrison VE, Bernabe E (2015) Long-term patterns of dental attendance and caries experience among British adults: a retrospective analysis. Eur J Oral Sci. 123:39-45. 10.1111/eos.12161
2. Bernabe E, Stansfeld SA, Marcenes W (2011) Roles of different sources of social support on caries experience and caries increment in adolescents of East london. Caries Res. 45:400-407. 10.1159/000330370
3. Cheema J, Sabbah W (2016) Inequalities in preventive and restorative dental services in England, Wales and Northern Ireland. Br Dent J. 221:235-239. 10.1038/sj.bdj.2016.641
4. Delgado-Angulo EK, Bernabé E, Marcenes W (2016) Ethnic inequalities in dental caries among adults in East London. Journal of public health. 38:e55-e62. 10.1093/pubmed/fdv097
5. Donaldson AN, Everitt B, Newton T, Steele J, Sherriff M, Bower E (2008) The effects of social class and dental attendance on oral health. J Dent Res. 87:60-64. 10.1177/154405910808700110
6. Maliderou M, Reeves S, Noble C (2006) The effect of social demographic factors, snack consumption and vending machine use on oral health of children living in London. Br Dent J. 201:441-444; discussion 437; quiz 466. 10.1038/sj.bdj.4814072
7. Steele J, Shen J, Tsakos G, Fuller E, Morris S, Watt R, Guarnizo-Herreno C, Wildman J (2015) The Interplay between socioeconomic inequalities and clinical oral health. J Dent Res. 94:19-26. 10.1177/0022034514553978
8. Treasure E, Kelly M, Nuttall N, Nunn J, Bradnock G, White D (2001) Factors associated with oral health: a multivariate analysis of results from the 1998 Adult Dental Health survey. Br Dent J. 190:60-68. 10.1038/sj.bdj.4800886a
9. Vernazza CR, Rolland SL, Chadwick B, Pitts N (2016) Caries experience, the caries burden and associated factors in children in England, Wales and Northern Ireland 2013. Br Dent J. 221:315-320. 10.1038/sj.bdj.2016.682
10. White DA, Tsakos G, Pitts NB, Fuller E, Douglas GV, Murray JJ, Steele JG (2012) Adult Dental Health Survey 2009: common oral health conditions and their impact on the population. Br Dent J. 213:567-572. 10.1038/sj.bdj.2012.1088
11. Alikutty FK, Bernabe E (2016) Long-term regular dental attendance and periodontal disease in the 1998 adult dental health survey. J Clin Periodontol. 43:114-120. 10.1111/jcpe.12496
12. Bower E, Gulliford M, Steele J, Newton T (2007) Area deprivation and oral health in Scottish adults: a multilevel study. Community Dent Oral Epidemiol. 35:118-129. 10.1111/j.1600-0528.2007.00308.x
13. Delgado-Angulo EK, Bernabé E, Marcenes W (2016) Ethnic inequalities in periodontal disease among British adults. J Clin Periodontol.Epub ahead of print. 10.1111/jcpe.12605
14. Habibian M, Roberts G, Lawson M, Stevenson R, Harris S (2001) Dietary habits and dental health over the first 18 months of life. Community Dent Oral Epidemiol. 29:239-246.

15. Moore S, Ide M, Wilson RF, Coward PY, Borkowska E, Baylis R, Bewley S, Maxwell DJ, Mulhair L, Ashley FP (2001) Periodontal health of London women during early pregnancy. Br Dent J. 191:570-573. 10.1038/sj.bdj.4801236a
16. Ramsay SE, Whincup PH, Watt RG, Tsakos G, Papacosta AO, Lennon LT, Wannamethee SG (2015) Burden of poor oral health in older age: findings from a population-based study of older British men. BMJ open. 5:e009476. 10.1136/bmjopen-2015-009476
17. Bernabe E, Sheiham A (2014) Tooth loss in the United Kingdom--trends in social inequalities: an age-period-and-cohort analysis. PLoS One. 9:e104808. 10.1371/journal.pone.0104808
18. Guarnizo-Herreno CC, Tsakos G, Sheiham A, Marmot MG, Kawachi I, Watt RG (2015) Austin Powers bites back: a cross sectional comparison of US and English national oral health surveys. BMJ. 351:h6543. 10.1136/bmj.h6543
19. Jagger DC, Sherriff A, Macpherson LM (2013) Measuring socio-economic inequalities in edentate Scottish adults--cross-sectional analyses using Scottish Health Surveys 1995-2008/09. Community Dent Oral Epidemiol. 41:499-508. 10.1111/cdoe.12040
20. Lowe G, Woodward M, Rumley A, Morrison C, Tunstall-Pedoe H, Stephen K (2003) Total tooth loss and prevalent cardiovascular disease in men and women: possible roles of citrus fruit consumption, vitamin C, and inflammatory and thrombotic variables. J Clin Epidemiol. 56:694-700.
21. Nuttall NM (2001) Oral health in Scotland 1972-1998. Health Bull (Edinb). 59:309-314.
22. Pearce MS, Steele JG, Mason J, Walls AW, Parker L (2004) Do circumstances in early life contribute to tooth retention in middle age? J Dent Res. 83:562-566. 10.1177/154405910408300710
23. Pearce MS, Steele JG, Campbell DI, Thomas JE (2005) Tooth loss and Helicobacter pylori seropositivity: the Newcastle Thousand Families Cohort Study at age 49-51 years. Helicobacter. 10:90-94. 10.1111/j.1523-5378.2005.00296.x
24. Pearce MS, Thomson WM, Walls AW, Steele JG (2009) Lifecourse socio-economic mobility and oral health in middle age. J Dent Res. 88:938-941. 10.1177/0022034509344524
25. Rouxel P, Tsakos G, Demakakos P, Zaninotto P, Watt RG (2015) Social Capital and Oral Health Among Adults 50 Years and Older: Results From the English Longitudinal Study of Ageing. Psychosom Med. 77:927-937. 10.1097/PSY.0000000000000197
26. Shen J, Wildman J, Steele J (2013) Measuring and decomposing oral health inequalities in an UK population. Community Dent Oral Epidemiol. 41:481-489. 10.1111/cdoe.12071
27. Starr JM, Hall RJ, Macintyre S, Deary IJ, Whalley LJ (2008) Predictors and correlates of edentulism in the healthy old people in Edinburgh (HOPE) study. Gerodontology. 25:199-204. 10.1111/j.1741-2358.2008.00227.x
28. Steele JG, Treasure E, Pitts NB, Morris J, Bradnock G (2000) Total tooth loss in the United Kingdom in 1998 and implications for the future. Br Dent J. 189:598-603.
29. Tsakos G, Herrick K, Sheiham A, Watt RG (2010) Edentulism and fruit and vegetable intake in low-income adults. J Dent Res. 89:462-467. 10.1177/0022034510363247

30. Tsakos G, Demakakos P, Breeze E, Watt RG (2011) Social gradients in oral health in older adults: findings from the English longitudinal survey of aging. Am J Public Health. 101:1892-1899. 10.2105/AJPH.2011.300215
31. Tsakos G, Watt RG, Rouxel PL, de Oliveira C, Demakakos P (2015) Tooth loss associated with physical and cognitive decline in older adults. J Am Geriatr Soc. 63:91-99. 10.1111/jgs.13190
32. Agel M, Marcenes W, Stansfeld SA, Bernabe E (2014) School bullying and traumatic dental injuries in East London adolescents. Br Dent J. 217:E26. 10.1038/sj.bdj.2014.1123
33. Blokland A, Watt RG, Tsakos G, Heilmann A (2016) Traumatic dental injuries and socioeconomic position - findings from the Children's Dental Health Survey 2013. Community Dent Oral Epidemiol. 44:586-591. 10.1111/cdoe.12252
34. Odoi R, Croucher R, Wong F, Marcenes W (2002) The relationship between problem behaviour and traumatic dental injury amongst children aged 7-15 years old. Community Dent Oral Epidemiol. 30:392-396.
35. Conway DI, McMahon AD, Smith K, Black R, Robertson G, Devine J, McKinney PA (2010) Components of socioeconomic risk associated with head and neck cancer: a population-based case-control study in Scotland. Br J Oral Maxillofac Surg. 48:11-17. 10.1016/j.bjoms.2009.03.020
36. Conway DI, McKinney PA, McMahon AD, Ahrens W, Schmeisser N, Benhamou S, Bouchardy C, Macfarlane GJ, Macfarlane TV, Lagiou P et al. (2010) Socioeconomic factors associated with risk of upper aerodigestive tract cancer in Europe. Eur J Cancer. 46:588-598. 10.1016/j.ejca.2009.09.028
37. Greenwood M, Thomson PJ, Lowry RJ, Steen IN (2003) Oral cancer: material deprivation, unemployment and risk factor behaviour--an initial study. Int J Oral Maxillofac Surg. 32:74-77. 10.1054/ijom.2002.0274
38. Nunn H, Lalli A, Fortune F, Croucher R (2009) Oral cancer screening in the Bangladeshi community of Tower Hamlets: a social model. Br J Cancer. 101 Suppl 2:S68-72. 10.1038/sj.bjc.6605394
39. Delgado-Angulo EK, Bernabe E (2015) Intergenerational mobility and adult oral health in a British cohort. Community Dent Oral Epidemiol. 43:255-261. 10.1111/cdoe.12149
40. Guarnizo-Herreno CC, Watt RG, Fuller E, Steele JG, Shen J, Morris S, Wildman J, Tsakos G (2014) Socioeconomic position and subjective oral health: findings for the adult population in England, Wales and Northern Ireland. BMC Public Health. 14:827. 10.1186/1471-2458-14-827
41. Ravaghi V, Holmes RD, Steele JG, Tsakos G (2016) The impact of oral conditions on children in England, Wales and Northern Ireland 2013. Br Dent J. 221:173-178. 10.1038/sj.bdj.2016.600
42. Macfarlane TV, Beasley M, Macfarlane GJ (2014) Self-Reported Facial Pain in UK Biobank Study: Prevalence and Associated Factors. J Oral Maxillofac Res. 5:e2. 10.5037/jomr.2014.5302
43. Nuttall NM, Steele JG, Evans D, Chadwick B, Morris AJ, Hill K (2006) The reported impact of oral condition on children in the United Kingdom, 2003. Br Dent J. 200:551-555. 10.1038/sj.bdj.4813586

44. Pau A, Croucher RE, Marcenes W (2007) Demographic and socio-economic correlates of dental pain among adults in the United Kingdom, 1998. Br Dent J. 202:E21; discussion 548-549. 10.1038/bdj.2007.171
45. Fernandes MJ, Ruta DA, Ogden GR, Pitts NB, Ogston SA (2006) Assessing oral health-related quality of life in general dental practice in Scotland: validation of the OHIP-14. Community Dent Oral Epidemiol. 34:53-62. 10.1111/j.1600-0528.2006.00254.x
46. Masood M, Newton T, Bakri NN, Khalid T, Masood Y (2017) The relationship between oral health and oral health related quality of life among elderly people in United Kingdom. J Dent. 56:78-83. 10.1016/j.jdent.2016.11.002
47. McGrath C, Bedi R, Gilthorpe MS (2000) Oral health related quality of life--views of the public in the United Kingdom. Community Dent Health. 17:3-7.
48. McGrath C, Bedi R (2001) An evaluation of a new measure of oral health related quality of life--OHQoL-UK(W). Community Dent Health. 18:138-143.
49. McGrath C, Bedi R (2002) Population based norming of the UK oral health related quality of life measure (OHQoL-UK). Br Dent J. 193:521-524; discussion 517.
50. McGrath C, Bedi R (2002) Measuring the impact of oral health on life quality in two national surveys - functionalist versus hermeneutic approaches. Community Dent Oral Epidemiol. 30:254-259.
51. McGrath C, Bedi R (2003) Measuring the impact of oral health on quality of life in Britain using OHQoL-UK(W). J Public Health Dent. 63:73-77.
52. Rouxel P, Tsakos G, Demakakos P, Zaninotto P, Chandola T, Watt RG (2015) Is Social Capital a Determinant of Oral Health among Older Adults? Findings from the English Longitudinal Study of Ageing. PLoS One. 10:e0125557. 10.1371/journal.pone.0125557
53. Sanders AE, Slade GD, John MT, Steele JG, Suominen-Taipale AL, Lahti S, Nuttall NM, Allen PF (2009) A cross-national comparison of income gradients in oral health quality of life in four welfare states: application of the Korpi and Palme typology. J Epidemiol Community Health. 63:569-574. 10.1136/jech.2008.083238
54. Tsakos G, Sheiham A, Iliffe S, Kharicha K, Harari D, Swift CG, Gillman G, Stuck AE (2009) The impact of educational level on oral health-related quality of life in older people in London. Eur J Oral Sci. 117:286-292. 10.1111/j.1600-0722.2009.00619.x
55. Levin KA, Currie C (2009) Inequalities in toothbrushing among adolescents in Scotland 1998-2006. Health Educ Res. 24:87-97. 10.1093/her/cym096
56. Levin KA, Currie C (2010) Adolescent toothbrushing and the home environment: sociodemographic factors, family relationships and mealtime routines and disorganisation. Community Dent Oral Epidemiol. 38:10-18. 10.1111/j.1600-0528.2009.00509.x
57. Levin KA, Nicholls N, Macdonald S, Dundas R, Douglas GV (2015) Geographic and socioeconomic variations in adolescent toothbrushing: a multilevel cross-sectional study of 15 year olds in Scotland. Journal of public health. 37:107-115. 10.1093/pubmed/fdu034
58. Macfarlane TV, Kawecki MM, Cunningham C, Bovaird I, Morgan R, Rhodes K, Watkins R. 2011. Mouthwash use in general population: results from Adult Dental

Health Survey in Grampian, Scotland. J Oral Maxillofac Res. [accessed 2011/01/01/Oct-Dec];1(4):e2. doi:10.5037/jomr.2010.1402.
59. Porter J, Ravaghi V, Hill KB, Watt RG (2016) Oral health behaviours of children in England, Wales and Northern Ireland 2013. Br Dent J. 221:263-268. 10.1038/sj.bdj.2016.646
60. Singh A, Rouxel P, Watt RG, Tsakos G (2013) Social inequalities in clustering of oral health related behaviors in a national sample of British adults. Prev Med. 57:102-106. 10.1016/j.ypmed.2013.04.018
61. Cribb VL, Jones LR, Rogers IS, Ness AR, Emmett PM (2011) Is maternal education level associated with diet in 10-year-old children? Public Health Nutr. 14:2037-2048. 10.1017/S136898001100036X
62. Dykes J, Watt RG, Nazroo J (2002) Socio-economic and ethnic influences on infant feeding practices related to oral health. Community Dent Health. 19:137-143.
63. Fraser GE, Welch A, Luben R, Bingham SA, Day NE (2000) The effect of age, sex, and education on food consumption of a middle-aged English cohort-EPIC in East Anglia. Prev Med. 30:26-34. 10.1006/pmed.1999.0598
64. Inchley J, Todd J, Bryce C, Currie C (2001) Dietary trends among Scottish schoolchildren in the 1990s. Journal of human nutrition and dietetics : the official journal of the British Dietetic Association. 14:207-216.
65. Ma Y, He FJ, Yin Y, Hashem KM, MacGregor GA (2016) Gradual reduction of sugar in soft drinks without substitution as a strategy to reduce overweight, obesity, and type 2 diabetes: a modelling study. The lancet Diabetes & endocrinology. 4:105-114. 10.1016/S2213-8587(15)00477-5
66. Maguire ER, Monsivais P (2015) Socio-economic dietary inequalities in UK adults: an updated picture of key food groups and nutrients from national surveillance data. Br J Nutr. 113:181-189. 10.1017/S0007114514002621
67. Mendonca N, Hill TR, Granic A, Davies K, Collerton J, Mathers JC, Siervo M, Wrieden WL, Seal CJ, Kirkwood TB et al. (2016) Macronutrient intake and food sources in the very old: analysis of the Newcastle 85+ Study. Br J Nutr. 115:2170-2180. 10.1017/S0007114516001379
68. Ntouva A, Tsakos G, Watt RG (2013) Sugars consumption in a low-income sample of British young people and adults. Br Dent J. 215:E2. 10.1038/sj.bdj.2013.655
69. Pechey R, Jebb SA, Kelly MP, Almiron-Roig E, Conde S, Nakamura R, Shemilt I, Suhrcke M, Marteau TM (2013) Socioeconomic differences in purchases of more vs. less healthy foods and beverages: analysis of over 25,000 British households in 2010. Soc Sci Med. 92:22-26. 10.1016/j.socscimed.2013.05.012
70. Rogers I, Emmett P, Team AS (2003) The effect of maternal smoking status, educational level and age on food and nutrient intakes in preschool children: results from the Avon Longitudinal Study of Parents and Children. Eur J Clin Nutr. 57:854-864. 10.1038/sj.ejcn.1601619
71. Rugg-Gunn AJ, Fletcher ES, Matthews JN, Hackett AF, Moynihan PJ, Kelly S, Adams J, Mathers JC, Adamson A (2007) Changes in consumption of sugars by English adolescents over 20 years. Public Health Nutr. 10:354-363. 10.1017/S1368980007249729

72. Skafida V, Treanor MC (2014) Do changes in objective and subjective family income predict change in children's diets over time? Unique insights using a longitudinal cohort study and fixed effects analysis. J Epidemiol Community Health. 68:534-541. 10.1136/jech-2013-203308
73. Watt RG, Dykes J, Sheiham A (2000) Preschool children's consumption of drinks: implications for dental health. Community Dent Health. 17:8-13.
74. Al-Haboubi M, Klass C, Jones K, Bernabe E, Gallagher JE (2013) Inequalities in the use of dental services among adults in inner South East London. Eur J Oral Sci. 121:176-181. 10.1111/eos.12043
75. Holmes RD, Porter J, Devapal L, White DA (2016) Patterns of care and service use amongst children in England, Wales and Northern Ireland 2013. Br Dent J. 221:509-514. 10.1038/sj.bdj.2016.781
76. Hullah E, Turok Y, Nauta M, Yoong W (2008) Self-reported oral hygiene habits, dental attendance and attitudes to dentistry during pregnancy in a sample of immigrant women in North London. Arch Gynecol Obstet. 277:405-409. 10.1007/s00404-007-0480-8
77. Labeit A, Peinemann F, Baker R (2013) Utilisation of preventative health check-ups in the UK: findings from individual-level repeated cross-sectional data from 1992 to 2008. BMJ open. 3:e003387. 10.1136/bmjopen-2013-003387
78. Lang IA, Gibbs SJ, Steel N, Melzer D (2008) Neighbourhood deprivation and dental service use: a cross-sectional analysis of older people in England. Journal of public health. 30:472-478. 10.1093/pubmed/fdn047
79. McGrath C (2001) Factors influencing dental service utilisation: Findings from a UK household survey. International Journal of Health Promotion and Education. 39:109-113.
80. McGrath C, Yeung CY, Bedi R (2002) Are single mothers in Britain failing to monitor their oral health? Postgrad Med J. 78:229-232.
81. McGrath C, Bedi R (2002) Influences of social support on the oral health of older people in Britain. J Oral Rehabil. 29:918-922.
82. Morris AJ, Nuttall NM, White DA, Pitts NB, Chestnutt IG, Evans D (2006) Patterns of care and service use amongst children in the UK 2003. Br Dent J. 200:429-434. 10.1038/sj.bdj.4813462
83. Pace-Balzan A, Butterworth C, Lowe D, Rogers SN (2014) Do head and neck cancer survivors attend a high street dentist on a regular basis? Eur J Prosthodont Restor Dent. 22:101-106.
84. Sabates R, Feinstein L (2008) Do income effects mask social and behavioural factors when looking at universal health care provision? Int J Public Health. 53:23-30.
85. Tchicaya A, Lorentz N (2014) Socioeconomic inequalities in the non-use of dental care in Europe. Int J Equity Health. 13:7. 10.1186/1475-9276-13-7
86. Macfarlane TV, Blinkhorn AS, Davies RM, Kincey J, Worthington HV (2003) Factors associated with health care seeking behaviour for orofacial pain in the general population. Community Dent Health. 20:20-26.
87. McGrath C, Bedi R (2002) Severe tooth loss among UK adults--who goes for oral rehabilitation? J Oral Rehabil. 29:240-244.

88. Patel R, Lawlor DA, Ebrahim S, British Women's H, Health Study c (2007) Socio-economic position and the use of preventive health care in older British women: a cross-sectional study using data from the British Women's Heart and Health Study cohort. Fam Pract. 24:7-10. 10.1093/fampra/cml064
89. Telford C, Murray L, Donaldson M, O'Neill C (2012) An analysis examining socio-economic variations in the provision of NHS general dental practitioner care under a fee for service contract among adolescents: Northern Ireland Longitudinal Study. Community Dent Oral Epidemiol. 40:70-79. 10.1111/j.1600-0528.2011.00649.x
90. Telford CJ, O'Neill C (2012) Changes in dental health investment across the adolescent years. Br Dent J. 212:E13. 10.1038/sj.bdj.2012.413
91. Al-Haboubi M, Zoitopoulos L, Beighton D, Gallagher J (2014) Oral health patterns of independently living dentate older people: a cross-sectional survey of dental attendees in south-east London. Gerodontology. 31:265-273. 10.1111/ger.12033
92. Blair YI, McMahon AD, Macpherson LM (2013) Comparison and relative utility of inequality measurements: as applied to Scotland's child dental health. PLoS One. 8:e58593. 10.1371/journal.pone.0058593
93. Blair YI, McMahon AD, Gnich W, Conway DI, Macpherson LM (2015) Elimination of 'the Glasgow effect' in levels of dental caries in Scotland's five-year-old children: 10 cross-sectional surveys (1994-2012). BMC Public Health. 15:212. 10.1186/s12889-015-1492-0
94. Broomhead T, Baker SR, Jones K, Richardson A, Marshman Z (2014) What are the most accurate predictors of caries in children aged 5 years in the UK? Community Dent Health. 31:111-116.
95. Conway DI, Quarrell I, McCall DR, Gilmour H, Bedi R, Macpherson LM (2007) Dental caries in 5-year-old children attending multi-ethnic schools in Greater Glasgow--the impact of ethnic background and levels of deprivation. Community Dent Health. 24:161-165.
96. Dugmore CR, Nunn JH (2004) Does the Community Dental Service provide primary dental care for dentally disadvantaged children? Prim Dent Care. 11:9-15.
97. Dugmore CR, Rock WP (2005) The effect of socio-economic status and ethnicity on the comparative oral health of Asian and White Caucasian 12-year-old children. Community Dent Health. 22:162-169.
98. Ellwood RP, Davies GM, Worthington HV, Blinkhorn AS, Taylor GO, Davies RM (2004) Relationship between area deprivation and the anticaries benefit of an oral health programme providing free fluoride toothpaste to young children. Community Dent Oral Epidemiol. 32:159-165. 10.1111/j.1600-0528.2004.00150.x
99. Foster GR, Downer MC, Lunt M, Aggarwal V, Tickle M (2009) Predictive tool for estimating the potential effect of water fluoridation on dental caries. Community Dent Health. 26:5-11.
100. Jones CM (2000) The effect of water fluoridation and social deprivation on tooth decay. International Journal of Health Promotion and Education. 38:146-150. 10.1080/14635240.2000.10806171
101. Jones CM, Worthington H (2000) Water fluoridation, poverty and tooth decay in 12-year-old children. J Dent. 28:389-393.

102. Levin KA, Davies CA, Topping GV, Assaf AV, Pitts NB (2009) Inequalities in dental caries of 5-year-old children in Scotland, 1993-2003. Eur J Public Health. 19:337-342. 10.1093/eurpub/ckp035
103. Levin KA, Jones CM, Wight C, Valentine C, Topping GV, Naysmith R (2009) Fluoride rinsing and dental health inequalities in 11-year-old children: an evaluation of a supervised school-based fluoride rinsing programme in Edinburgh. Community Dent Oral Epidemiol. 37:19-26. 10.1111/j.1600-0528.2008.00445.x
104. Levin KA, Davies CA, Douglas GV, Pitts NB (2010) Urban-rural differences in dental caries of 5-year old children in Scotland. Soc Sci Med. 71:2020-2027. 10.1016/j.socscimed.2010.09.006
105. McGrady MG, Ellwood RP, Maguire A, Goodwin M, Boothman N, Pretty IA (2012) The association between social deprivation and the prevalence and severity of dental caries and fluorosis in populations with and without water fluoridation. BMC Public Health. 12:1122. 10.1186/1471-2458-12-1122
106. McMahon AD, Blair Y, McCall DR, Macpherson LM (2010) The dental health of three-year-old children in Greater Glasgow, Scotland. Br Dent J. 209:E5. 10.1038/sj.bdj.2010.723
107. McMahon AD, Blair Y, McCall DR, Macpherson LM (2011) Reductions in dental decay in 3-year old children in Greater Glasgow and Clyde: repeated population inspection studies over four years. BMC Oral Health. 11:29. 10.1186/1472-6831-11-29
108. Milsom KM, Rice A, Kearney-Mitchell P, Kellett L (2014) A review of a child population dental preventive programme in Halton and St Helens. Br Dent J. 216:E18. 10.1038/sj.bdj.2014.334
109. Muirhead V, Marcenes W (2004) An ecological study of caries experience, school performance and material deprivation in 5-year-old state primary school children. Community Dent Oral Epidemiol. 32:265-270. 10.1111/j.1600-0528.2004.00147.x
110. Radford JR, Ballantyne HM, Nugent Z, Beighton D, Robertson M, Longbottom C, Pitts NB (2000) Caries-associated micro-organisms in infants from different socio-economic backgrounds in Scotland. J Dent. 28:307-312.
111. Radford JR, Ballantyne HM, Nugent ZJ, Robertson M, Longbottom C, Pitts NB, Beighton D, Brailsford SR (2001) Does social deprivation in 1, 2, 3 and 4-year-old Scottish infants influence the frequency isolation of caries-associated micro-organisms? J Dent. 29:325-332.
112. Stephenson J, Chadwick BL, Playle RA, Treasure ET (2010) Modelling childhood caries using parametric competing risks survival analysis methods for clustered data. Caries Res. 44:69-80. 10.1159/000279326
113. Tickle M, Brown P, Blinkhorn A, Jenner T (2000) Comparing the ability of different area measures of socioeconomic status to segment a population according to caries prevalence. Community Dent Health. 17:138-144.
114. Tickle M, Kay E, Worthington H, Blinkhorn A (2000) Predicting population dental disease experience at a small area level using Census and health service data. J Public Health Med. 22:368-374.
115. Tickle M, Moulding G, Milsom K, Blinkhorn A (2000) Dental caries, contact with dental services and deprivation in young children: their relationship at a small area level. Br Dent J. 189:376-379.

116. Tickle M, Milsom K, Blinkhorn A (2002) Inequalities in the dental treatment provided to children: an example from the UK. Community Dent Oral Epidemiol. 30:335-341.
117. Bakathir AA, Moos KF, Ayoub AF, Bagg J (2009) Factors Contributing to the Spread of Odontogenic Infections: A prospective pilot study. Sultan Qaboos Univ Med J. 9:296-304.
118. Byers J, Lowe T, Goodall CA (2012) Acute cervico-facial infection in Scotland 2010: patterns of presentation, patient demographics and recording of systemic involvement. Br J Oral Maxillofac Surg. 50:626-630. 10.1016/j.bjoms.2011.11.013
119. Pine CM, Harris RV, Burnside G, Merrett MC (2006) An investigation of the relationship between untreated decayed teeth and dental sepsis in 5-year-old children. Br Dent J. 200:45-47; discussion 29. 10.1038/sj.bdj.4813124
120. Marcenes W, Murray S (2001) Social deprivation and traumatic dental injuries among 14-year-old schoolchildren in Newham, London. Dent Traumatol. 17:17-21.
121. Marcenes W, Murray S (2002) Changes in prevalence and treatment need for traumatic dental injuries among 14-year-old children in Newham, London: a deprived area. Community Dent Health. 19:104-108.
122. Rhouma O, McMahon AD, Welbury R (2013) Traumatic dental injury and social deprivation in five-year-old children in Scotland 1993-2007. Br Dent J. 214:E26. 10.1038/sj.bdj.2013.505
123. Abel GA, Shelton J, Johnson S, Elliss-Brookes L, Lyratzopoulos G (2015) Cancer-specific variation in emergency presentation by sex, age and deprivation across 27 common and rarer cancers. Br J Cancer. 112 Suppl 1:S129-136. 10.1038/bjc.2015.52
124. Anandan C, Elton R, Hitchings A, Brewster DH (2008) Nasopharyngeal cancer incidence and survival in Scotland, 1975-2001. Clin Otolaryngol. 33:12-17. 10.1111/j.1749-4486.2007.01590.x
125. Brocklehurst P, Rafiq R, Lowe D, Rogers S (2012) Analysis of the impact of deprivation on urgent suspected head and neck cancer referrals in the Mersey region between January 2004 to December 2006. Br J Oral Maxillofac Surg. 50:215-220. 10.1016/j.bjoms.2011.05.002
126. Conway DI, Brewster DH, McKinney PA, Stark J, McMahon AD, Macpherson LM (2007) Widening socio-economic inequalities in oral cancer incidence in Scotland, 1976-2002. Br J Cancer. 96:818-820. 10.1038/sj.bjc.6603621
127. Ellis L, Rachet B, Birchall M, Coleman MP (2012) Trends and inequalities in laryngeal cancer survival in men and women: England and Wales 1991-2006. Oral Oncol. 48:284-289. 10.1016/j.oraloncology.2011.10.012
128. Lim LT, Agarwal PK, Young D, Ah-Kee EY, Diaper CJ (2015) The Effect of Socio-Economic Status on Severity of Periocular Basal Cell Carcinoma at Presentation. Ophthal Plast Reconstr Surg. 31:456-458. 10.1097/IOP.0000000000000386
129. Moles DR, Fedele S, Speight PM, Porter SR, dos Santos Silva I (2008) Oral and pharyngeal cancer in South Asians and non-South Asians in relation to socioeconomic deprivation in South East England. Br J Cancer. 98:633-635. 10.1038/sj.bjc.6604191
130. Paterson IC, John G, Adams Jones D (2002) Effect of deprivation on survival of patients with head and neck cancer: a study of 20,131 cases. Clin Oncol (R Coll Radiol). 14:455-458.

131. Purkayastha M, McMahon AD, Gibson J, Conway DI (2016) Trends of oral cavity, oropharyngeal and laryngeal cancer incidence in Scotland (1975-2012) - A socioeconomic perspective. Oral Oncol. 61:70-75. 10.1016/j.oraloncology.2016.08.015
132. Robertson G, Greenlaw N, Steering Group Committee for the Scottish Audit of H, Neck C, Bray CA, Morrison DS (2010) Explaining the effects of socio-economic deprivation on survival in a national prospective cohort study of 1909 patients with head and neck cancers. Cancer Epidemiol. 34:682-688. 10.1016/j.canep.2010.05.009
133. Rylands J, Lowe D, Rogers SN (2016) Outcomes by area of residence deprivation in a cohort of oral cancer patients: Survival, health-related quality of life, and place of death. Oral Oncol. 52:30-36. 10.1016/j.oraloncology.2015.10.017
134. Sharpe KH, McMahon AD, McClements P, Watling C, Brewster DH, Conway DI (2012) Socioeconomic inequalities in incidence of lung and upper aero-digestive tract cancer by age, tumour subtype and sex: a population-based study in Scotland (2000-2007). Cancer Epidemiol. 36:e164-170. 10.1016/j.canep.2012.01.007
135. Taib BG, Oakley J, Dailey Y, Hodge I, Wright P, du Plessis R, Rylands J, Taylor-Robinson D, Povall S, Schache A et al. (2018) Socioeconomic deprivation and the burden of head and neck cancer—Regional variations of incidence and mortality in Merseyside and Cheshire, North West, England. Clin Otolaryngol.n/a-n/a. 10.1111/coa.13067
136. Tataru D, Mak V, Simo R, Davies EA, Gallagher JE (2017) Trends in the epidemiology of head and neck cancer in London. Clin Otolaryngol. 42:104-114. 10.1111/coa.12673
137. Warnakulasuriya S, Mak V, Moller H (2007) Oral cancer survival in young people in South East England. Oral Oncol. 43:982-986. 10.1016/j.oraloncology.2006.11.021
138. Csikar J, Kang J, Wyborn C, Dyer TA, Marshman Z, Godson J (2016) The Self-Reported Oral Health Status and Dental Attendance of Smokers and Non-Smokers in England. PLoS One. 11:e0148700. 10.1371/journal.pone.0148700
139. Marshman Z, Dyer TA, Wyborn CG, Beal J, Godson JH (2010) The oral health of adults in Yorkshire and Humber 2008. Br Dent J. 209:E9. 10.1038/sj.bdj.2010.819
140. Benson PE, Da'as T, Johal A, Mandall NA, Williams AC, Baker SR, Marshman Z (2015) Relationships between dental appearance, self-esteem, socio-economic status, and oral health-related quality of life in UK schoolchildren: A 3-year cohort study. Eur J Orthod. 37:481-490. 10.1093/ejo/cju076
141. Pau A, Allen CD (2011) Self-reported oral health status of adults resident in Medway, Kent in 2009. Prim Dent Care. 18:173-179. 10.1308/135576111797512748
142. Wells M, Swartzman S, Lang H, Cunningham M, Taylor L, Thomson J, Philp J, McCowan C (2016) Predictors of quality of life in head and neck cancer survivors up to 5 years after end of treatment: a cross-sectional survey. Support Care Cancer. 24:2463-2472. 10.1007/s00520-015-3045-6
143. Woolley E, Magennis P, Shokar P, Lowe D, Edwards D, Rogers SN (2006) The correlation between indices of deprivation and health-related quality of life in patients with oral and oropharyngeal squamous cell carcinoma. Br J Oral Maxillofac Surg. 44:177-186. 10.1016/j.bjoms.2005.06.024
144. Eckersley AJ, Blinkhorn FA (2001) Dental attendance and dental health behaviour in children from deprived and non-deprived areas of Salford, north-west England. Int J Paediatr Dent. 11:103-109.

145. Trubey RJ, Moore SC, Chestnutt IG (2015) Children's toothbrushing frequency: the influence of parents' rationale for brushing, habits and family routines. Caries Res. 49:157-164. 10.1159/000365152
146. Barton KL, Wrieden WL, Sherriff A, Armstrong J, Anderson AS (2015) Trends in socio-economic inequalities in the Scottish diet: 2001-2009. Public Health Nutr. 18:2970-2980. 10.1017/S1368980015000361
147. Cameron F, Weaver L, Wright C, Welbury R (2006) Dietary and Social Characteristics of Children with Severe Tooth Decay. Scott Med J. 51:26-29. 10.1258/rsmsmj.51.3.26
148. Lakerveld J, Ben Rebah M, Mackenbach JD, Charreire H, Compernolle S, Glonti K, Bardos H, Rutter H, De Bourdeaudhuij I, Brug J et al. (2015) Obesity-related behaviours and BMI in five urban regions across Europe: sampling design and results from the SPOTLIGHT cross-sectional survey. BMJ open. 5:e008505. 10.1136/bmjopen-2015-008505
149. McNeill G, Masson LF, Craig LC, Macdiarmid JI, Holmes BA, Nelson M, Sheehy C (2010) Sugar and fat intake among children in Scotland: what is needed to reach the dietary targets? Public Health Nutr. 13:1286-1294. 10.1017/S1368980009992175
150. McNeill G, Masson LF, Macdiarmid JI, Craig LC, Wills WJ, Bromley C (2017) Socio-economic differences in diet, physical activity and leisure-time screen use among Scottish children in 2006 and 2010: are we closing the gap? Public Health Nutr. 20:951-958. 10.1017/S1368980016002949
151. Spence S, Matthews JN, White M, Adamson AJ (2014) A repeat cross-sectional study examining the equitable impact of nutritional standards for school lunches in England in 2008 on the diets of 4-7y olds across the socio-economic spectrum. Int J Behav Nutr Phys Act. 11:128. 10.1186/s12966-014-0128-6
152. Gallagher JE, Cooper DJ, Wright D (2009) Deprivation and access to dental care in a socially diverse metropolitan area. Community Dent Health. 26:92-98.
153. Jones CM (2001) Capitation registration and social deprivation in England. An inverse 'dental' care law? Br Dent J. 190:203-206. 10.1038/sj.bdj.4800925a
154. Maunder P, Landes DP, Steen N (2006) The equity of access to primary dental care for children in the North East of England. Community Dent Health. 23:116-119.
155. Milsom KM, Threlfall AG, Blinkhorn AS, Kearney-Mitchell PI, Buchanan KM, Tickle M (2006) The effectiveness of school dental screening: dental attendance and treatment of those screened positive. Br Dent J. 200:687-690; discussion 673. 10.1038/sj.bdj.4813724
156. Blinkhorn FA (2000) The aetiology of dento-alveolar injuries and factors influencing attendance for emergency care of adolescents in the north west of England. Endod Dent Traumatol. 16:162-165.
157. Dyer TA, Skinner J, Canning D, Green JR (2010) A health equity methodology for auditing oral health and NHS General Dental Services in Sheffield, England. Community Dent Health. 27:68-73.
158. Landes DP, Jardine C (2009) Are restrictive NHS contracts of benefit in addressing health inequalities? An ecological evaluation of their value in the North East of England. Br Dent J. 207:E16; discussion p 368. 10.1038/sj.bdj.2009.857
159. Landes DP, Jardine C (2010) Targeting dental resources to reduce inequalities in oral health in the North East of England - a health equity audit methodology to evaluate the

effects of practice location, practice population and deprivation. Br Dent J. 209:E3. 10.1038/sj.bdj.2010.676
160. Milsom KM, Jones C, Kearney-Mitchell P, Tickle M (2009) A comparative needs assessment of the dental health of adults attending dental access centres and general dental practices in Halton & St Helens and Warrington PCTs 2007. Br Dent J. 206:257-261. 10.1038/sj.bdj.2009.165
161. Moles DR, Ashley P (2009) Hospital admissions for dental care in children: England 1997-2006. Br Dent J. 206:E14; discussion 378-379. 10.1038/sj.bdj.2009.254
162. Morris E, Landes D (2006) The equity of access to orthodontic dental care for children in the North East of England. Public Health. 120:359-363. 10.1016/j.puhe.2005.10.017
163. Tickle M, Moulding G, Milsom K, Blinkhorn A (2000) Socioeconomic and geographical influences on primary dental care preferences in a population of young children. Br Dent J. 188:559-562.
164. Tickle M, Milsom KM, King D, Blinkhorn AS (2003) The influences on preventive care provided to children who frequently attend the UK General Dental Service. Br Dent J. 194:329-332; discussion 318. 10.1038/sj.bdj.4809947
165. Arora G, Mackay DF, Conway DI, Pell JP (2016) Ethnic differences in oral health and use of dental services: cross-sectional study using the 2009 Adult Dental Health Survey. BMC Oral Health. 17:1. 10.1186/s12903-016-0228-6
166. Bedi R, Lewsey JD, Gilthorpe MS (2000) Changes in oral health over ten years amongst UK children aged 4-5 years living in a deprived multiethnic area. Br Dent J. 189:88-92.
167. Davies GM, Blinkhorn FA, Duxbury JT (2001) Caries among 3-year-olds in greater Manchester. Br Dent J. 190:381-384. 10.1038/sj.bdj.4800979a
168. Gray M, Morris AJ, Davies J (2000) The oral health of South Asian five-year-old children in deprived areas of Dudley compared with White children of equal deprivation and fluoridation status. Community Dent Health. 17:243-245.
169. Marcenes W, Muirhead VE, Murray S, Redshaw P, Bennett U, Wright D (2013) Ethnic disparities in the oral health of three- to four-year-old children in East London. Br Dent J. 215:E4. 10.1038/sj.bdj.2013.687
170. Newton JT, Robinson PG, Khan F, Gelbier S, Gibbons DE (2002) Testing a model of the relationship between gender, ethnicity, clinical status and impact in older adults from minority ethnic groups. Gerodontology. 19:102-108.
171. Pine C, Burnside G, Craven R (2003) Inequalities in dental health in the north-west of England. Community Dent Health. 20:55-56.
172. Robinson PG, Bhavnani V, Khan FA, Newton T, Pitt J, Thorogood N, Gelbier S, Gibbons D (2000) Dental caries and treatment experience of adults from minority ethnic communities living in the South Thames Region, UK. Community Dent Health. 17:41-47.
173. Newton JT, Khan FA, Bhavnani V, Pitt J, Gelbier S, Gibbons DE (2000) Self-assessed oral health status of ethnic minority residents of South London. Community Dent Oral Epidemiol. 28:424-434.
174. Pau AKH, Croucher R (2001) Self-reported oral health status and oral-health related behaviours of a sample of Chinese elders in Inner London, UK: A pilot investigation.

International Journal of Health Promotion and Education. 39:80-85. 10.1080/14635240.2001.10806177
175. Ramchandani D, Marcenes W, Stansfeld SA, Bernabe E (2016) Problem behaviour and traumatic dental injuries in adolescents. Dent Traumatol. 32:65-70. 10.1111/edt.12220
176. Shujaat NG, Idris SH (2008) Relationship Between Ethnicity And Traumatic Dental Injuries Among 14 Year Old Children In Newham — A Deprived Area Of London. Pakistan Oral & Dental Journal 28:289-294.
177. Csikar J, Aravani A, Godson J, Day M, Wilkinson J (2013) Incidence of oral cancer among South Asians and those of other ethnic groups by sex in West Yorkshire and England, 2001-2006. Br J Oral Maxillofac Surg. 51:25-29. 10.1016/j.bjoms.2012.03.008
178. Donaldson CD, Jack RH, Moller H, Luchtenborg M (2012) Oral cavity, pharyngeal and salivary gland cancer: disparities in ethnicity-specific incidence among the London population. Oral Oncol. 48:799-802. 10.1016/j.oraloncology.2012.03.005
179. Elledge RO, Khazaee-Farid R, Walker RJ, Sundaram K, Monaghan A (2011) A library-based ecological study to investigate the contribution of ethnicity to the incidence of oral cancer within health authorities in England and Wales. Br J Oral Maxillofac Surg. 49:42-46. 10.1016/j.bjoms.2009.12.010
180. McGurk M, Chan C, Jones J, O'Regan E, Sherriff M (2005) Delay in diagnosis and its effect on outcome in head and neck cancer. Br J Oral Maxillofac Surg. 43:281-284. 10.1016/j.bjoms.2004.01.016
181. Moles DR, Fedele S, Speight PM, Porter SR (2007) The unclear role of ethnicity in health inequalities: the scenario of oral cancer incidence and survival in the British South Asian population. Oral Oncol. 43:831-834. 10.1016/j.oraloncology.2006.12.005
182. Mandall NA, McCord JF, Blinkhorn AS, Worthington HV, O'Brien KD (2000) Perceived aesthetic impact of malocclusion and oral self-perceptions in 14-15-year-old Asian and Caucasian children in greater Manchester. Eur J Orthod. 22:175-183.
183. Newton JT, Corrigan M, Gibbons DE, Locker D (2003) The self-assessed oral health status of individuals from White, Indian, Chinese and Black Caribbean communities in South-east England. Community Dent Oral Epidemiol. 31:192-199.
184. Abdelrahim R, Delgado-Angulo EK, Gallagher JE, Bernabe E (2017) Ethnic Disparities in Oral Health Related Quality of Life among Adults in London, England. Community Dent Health. 34:122-127. 10.1922/CDH_4067Abderlrahim06
185. Bryant M, Sahota P, Santorelli G, Hill A (2015) An exploration and comparison of food and drink availability in homes in a sample of families of White and Pakistani origin within the UK. Public Health Nutr. 18:1197-1205. 10.1017/S1368980014000147
186. Goff LM, Timbers L, Style H, Knight A (2015) Dietary intake in Black British adults; an observational assessment of nutritional composition and the role of traditional foods in UK Caribbean and West African diets. Public Health Nutr. 18:2191-2201. 10.1017/S1368980014002584
187. Sahota P, Gatenby LA, Greenwood DC, Bryant M, Robinson S, Wright J (2016) Ethnic differences in dietary intake at age 12 and 18 months: the Born in Bradford 1000 Study. Public Health Nutr. 19:114-122. 10.1017/S1368980015000932

188. Stone MA, Bankart J, Sinfield P, Talbot D, Farooqi A, Davies MJ, Khunti K (2007) Dietary habits of young people attending secondary schools serving a multiethnic, inner-city community in the UK. Postgrad Med J. 83:115-119. 10.1136/pgmj.2006.050864
189. Ahluwalia M, Brailsford SR, Tarelli E, Gilbert SC, Clark DT, Barnard K, Beighton D (2004) Dental caries, oral hygiene, and oral clearance in children with craniofacial disorders. J Dent Res. 83:175-179. 10.1177/154405910408300218
190. Britton KF, Welbury RR (2010) Dental caries prevalence in children with cleft lip/palate aged between 6 months and 6 years in the West of Scotland. Eur Arch Paediatr Dent. 11:236-241.
191. Chapple JR, Nunn JH (2001) The oral health of children with clefts of the lip, palate, or both. Cleft Palate Craniofac J. 38:525-528. 10.1597/1545-1569_2001_038_0525_tohocw_2.0.co_2
192. Choa RM, Slator R, Jeremy A, Robinson S, Franklin D, Roberts A, Winter R, Extence H, Collard M, Clark V (2014) Identifying the effect of cleft type, deprivation and ethnicity on speech and dental outcomes in UK cleft patients: a multi-centred study. J Plast Reconstr Aesthet Surg. 67:1637-1643. 10.1016/j.bjps.2014.07.018
193. Cumella S, Ransford N, Lyons J, Burnham H (2000) Needs for oral care among people with intellectual disability not in contact with Community Dental Services. J Intellect Disabil Res. 44 (Pt 1):45-52.
194. Eldridge K, Gallagher JE (2000) Dental caries prevalence and dental health behaviour in HIV infected children. Int J Paediatr Dent. 10:19-26.
195. Lucas VS, Gupta R, Ololade O, Gelbier M, Roberts GJ (2000) Dental health indices and caries associated microflora in children with unilateral cleft lip and palate. Cleft Palate Craniofac J. 37:447-452. 10.1597/1545-1569_2000_037_0447_dhiaca_2.0.co_2
196. Percival T, Aylett SE, Pool F, Bloch-Zupan A, Roberts GJ, Lucas VS (2009) Oral health of children with intractable epilepsy attending the UK National Centre for Young People with Epilepsy. Eur Arch Paediatr Dent. 10:19-24.
197. Richards H, van Bommel A, Clark V, Richard B (2015) Are cleft palate fistulae a cause of dental decay? Cleft Palate Craniofac J. 52:341-345. 10.1597/13-282
198. Sheehy EC, Roberts GJ, Beighton D, O'Brien G (2000) Oral health in children undergoing liver transplantation. Int J Paediatr Dent. 10:109-119.
199. Turner S, Sweeney M, Kennedy C, Macpherson L (2008) The oral health of people with intellectual disability participating in the UK Special Olympics. J Intellect Disabil Res. 52:29-36. 10.1111/j.1365-2788.2007.00971.x
200. Watson EK, Moles DR, Kumar N, Porter SR (2010) The oral health status of adults with a visual impairment, their dental care and oral health information needs. Br Dent J. 208:E15. 10.1038/sj.bdj.2010.395
201. Baird WO, McGrother C, Abrams KR, Dugmore C, Jackson RJ (2007) Factors that influence the dental attendance pattern and maintenance of oral health for people with multiple sclerosis. Bdj. 202:E4. 10.1038/bdj.2006.125
202. Djemal S, Rumjon A, Macdougall IC, Singh P, Warnakulasuriya S (2016) Dental Attendance and Self-reported Oral Health Status of Renal Dialysis Patients: A

Comparison of Results with the UK Adult Dental Health Survey. Oral health & preventive dentistry. 14:529-534. 10.3290/j.ohpd.a37138
203. McCreadie RG, Stevens H, Henderson J, Hall D, McCaul R, Filik R, Young G, Sutch G, Kanagaratnam G, Perrington S et al. (2004) The dental health of people with schizophrenia. Acta Psychiatr Scand. 110:306-310. 10.1111/j.1600-0447.2004.00373.x
204. Hunter RV, Clarkson JE, Fraser HW, MacWalter RS (2006) A preliminary investigation into tooth care, dental attendance and oral health related quality of life in adult stroke survivors in Tayside, Scotland. Gerodontology. 23:140-148. 10.1111/j.1741-2358.2006.00125.x
205. Stanfield M, Stanfield M, Scully C, Davison MF, Porter S (2003) Oral healthcare of clients with learning disability: changes following relocation from hospital to community. Br Dent J. 194:271-277; discussion 262. 10.1038/sj.bdj.4809931
206. Champion J, Holt R (2000) Dental care for children and young people who have a hearing impairment. Br Dent J. 189:155-159.
207. Lawrence M, Aleid W, McKechnie A (2013) Access to dental services for head and neck cancer patients. Br J Oral Maxillofac Surg. 51:404-407. 10.1016/j.bjoms.2012.10.004
208. Rodd HD, Clark EL, Stern MR, Baker SR (2007) Failed attendances at hospital dental clinics among young patients with cleft lip and palate. Cleft Palate Craniofac J. 44:92-94. 10.1597/05-162
209. Dashash M, Nugent J, Baker P, Tansinda D, Blinkhorn F (2008) Interleukin-6 -174 genotype, periodontal disease and adverse pregnancy outcomes: a pilot study. J Clin Immunol. 28:237-243. 10.1007/s10875-007-9162-3
210. Moore S, Ide M, Coward PY, Randhawa M, Borkowska E, Baylis R, Wilson RF (2004) A prospective study to investigate the relationship between periodontal disease and adverse pregnancy outcome. Br Dent J. 197:251-258; discussion 247. 10.1038/sj.bdj.4811620
211. Coles E, Chan K, Collins J, Humphris GM, Richards D, Williams B, Freeman R (2011) Decayed and missing teeth and oral-health-related factors: predicting depression in homeless people. J Psychosom Res. 71:108-112. 10.1016/j.jpsychores.2011.01.004
212. Collins J, Freeman R (2007) Homeless in North and West Belfast: an oral health needs assessment. Br Dent J. 202:E31. 10.1038/bdj.2007.473
213. Daly B, Newton JT, Batchelor P (2010) Patterns of dental service use among homeless people using a targeted service. J Public Health Dent. 70:45-51. 10.1111/j.1752-7325.2009.00142.x
214. Daly B, Newton T, Batchelor P, Jones K (2010) Oral health care needs and oral health-related quality of life (OHIP-14) in homeless people. Community Dent Oral Epidemiol. 38:136-144. 10.1111/j.1600-0528.2009.00516.x
215. Waplington J, Morris J, Bradnock G (2000) The dental needs, demands and attitudes of a group of homeless people with mental health problems. Community Dent Health. 17:134-137.
216. Richards W, Keauffling J (2009) Homeless who accessed a healthy living centre in Swansea, South Wales: an assessment of the impact of oral ill-health. Prim Dent Care. 16:94-98. 10.1308/135576109788634287

217. Hill KB, Rimington D (2011) Investigation of the oral health needs for homeless people in specialist units in London, Cardiff, Glasgow and Birmingham. Prim Health Care Res Dev. 12:135-144. 10.1017/S1463423610000368
218. Sprake EF, Russell JM, Barker ME (2014) Food choice and nutrient intake amongst homeless people. Journal of human nutrition and dietetics : the official journal of the British Dietetic Association. 27:242-250. 10.1111/jhn.12130
219. Simons D, Pearson N, Movasaghi Z (2012) Developing dental services for homeless people in East London. Br Dent J. 213:E11. 10.1038/sj.bdj.2012.891
220. Heidari E, Dickinson C, Wilson R, Fiske J (2007) Oral health of remand prisoners in HMP Brixton, London. Br Dent J. 202:E1. 10.1038/bdj.2007.32
221. Heidari E, Dickinson C, Fiske J (2008) An investigation into the oral health status of male prisoners in the UK. Journal of Disability and Oral Health. 9:3-12.
222. Jones CM, Woods K, Neville J, Whittle JG (2005) Dental health of prisoners in the north west of England in 2000: literature review and dental health survey results. Community Dent Health. 22:113-117.
223. Lunn H, Morris J, Jacob A, Grummitt C (2003) The oral health of a group of prison inmates. Dent Update. 30:135-138. 10.12968/denu.2003.30.3.135
224. Marshman Z, Baker SR, Robinson PG (2014) Does dental indifference influence the oral health-related quality of life of prisoners? Community Dent Oral Epidemiol. 42:470-480. 10.1111/cdoe.12097
225. Rouxel P, Duijster D, Tsakos G, Watt RG (2013) Oral health of female prisoners in HMP Holloway: implications for oral health promotion in UK prisons. Br Dent J. 214:627-632. 10.1038/sj.bdj.2013.581
226. Doughty J, Simons D, Pearson N, Evans P, Wright D (2016) Challenges identified in a pilot outreach dental service for Traveller children in Hackney, East London. Community Dent Health. 33:185-188. 10.1922/CDH_3909Doughty04
227. Keene EJ, Skelton R, Day PF, Munyombwe T, Balmer RC (2015) The dental health of children subject to a child protection plan. Int J Paediatr Dent. 25:428-435. 10.1111/ipd.12149
228. Sarri G, Evans P, Stansfeld S, Marcenes W (2012) A school-based epidemiological study of dental neglect among adolescents in a deprived area of the UK. Br Dent J. 213:E17. 10.1038/sj.bdj.2012.1042
229. Williams J, Jackson S, Maddocks A, Cheung WY, Love A, Hutchings H (2001) Case–control study of the health of those looked after by local authorities. Arch Dis Child. 85:280. 10.1136/adc.85.4.280

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000

Website: www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

Published: March 2021
PHE gateway number: GW-1921

PHE supports the UN Sustainable Development Goals

SUSTAINABLE DEVELOPMENT GOALS