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Ethnic variations in upper gastrointestinal hospitalisations and deaths: the Scottish Health and Ethnicity Linkage Study

Short title: Ethnic variations in upper GI diseases

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ABSTRACT

Background

Upper gastrointestinal (GI) diseases are common, but there is a paucity of data describing variations by ethnic group and so a lack of understanding of potential health inequalities. We studied the incidence of specific upper GI hospitalisation and death by ethnicity in Scotland.

Methods

Using the Scottish Health and Ethnicity Linkage Study (SHELS), linking NHS hospitalisations and mortality to the Scottish Census 2001, we explored ethnic differences in incidence (2001-2010) of oesophagitis, peptic ulcer disease, gallstone disease and pancreatitis. Risk ratios (RRs) and 95% confidence intervals (CI) were calculated using Poisson regression, multiplied by 100, stratified by sex and adjusted for age, country of birth and socio-economic position. The White Scottish population (100) was the reference population.

Results

Ethnic variations varied by outcome and sex e.g. adjusted RRs (95% CIs) for oesophagitis were comparatively higher in Bangladeshi women (209; 124-352) and lower in Chinese men (65; 51-84) and women (69; 55-88). For peptic ulcer disease, RRs were higher in Chinese men (171; 131-223). Pakistani women had higher RRs for gallstone disease (129; 112-148) and pancreatitis (147; 109-199). The risks of upper GI diseases were lower in Other White British and Other White (e.g. for peptic ulcer disease in men respectively (74; 64-85) and (81; 69-94)).

Conclusion

Risks of common upper GI diseases were comparatively lower in most White ethnic groups in Scotland. In non-White groups, however, risk varied by disease and ethnic group. These results require consideration in health policy, service planning and future research.

Keywords

Ethnicity, oesophagitis, peptic ulcer disease, gallstone disease, pancreatitis.

INTRODUCTION

Gastrointestinal (GI) disease is the most common cause of hospital admission in the UK (1) and the overall burden of upper GI diseases has increased in past decades, particularly the incidence of pancreatitis, gallstone-related disease and upper GI haemorrhage (1). Although peptic ulcer disease incidence in most age groups has decreased in the UK, this has increased in elderly people, associated with higher use of ulcerogenic drugs (2;3). Peptic ulcer disease, upper GI haemorrhage and acute pancreatitis are more common in Scotland than in southern England (1;4;5).

Whilst differences by ethnicity are known to exist for many chronic diseases such as coronary heart disease and common cancers (6-9), such differences in upper GI diseases are seldom studied in Europe. Previous studies have also been hampered by using country of birth as a proxy for ethnicity and looking at small hospital-based populations for single disease outcomes (10;11). We have published our findings on ethnic differences in lower GI diseases (12) but to date, no known published studies have assessed ethnic variations in a range of upper GI diseases. Using the Scottish health and ethnicity linkage study (SHELS), linking NHS hospitalisations and mortality to the Scottish Census 2001 (13), we explored ethnic differences in the incidence of specific upper GI hospitalisation and death in Scotland from May 2001 to April 2010. We selected specific upper GI diseases with more than 1000 hospitalisations per year to ensure sufficient numbers for an analysis by ethnicity i.e. oesophagitis, peptic ulcer disease, gallstone disease and pancreatitis (available for gastritis as supplementary analysis as it was not primary i.e. less severe and linked to peptic ulcer disease). We hypothesised ethnic differences in White and non-White minority ethnic groups with a lower incidence in Other White British compared to White Scottish. Hypotheses about the causes of common upper GI

disorders exist, but are limited, and exploring ethnic variations by upper GI disease outcomes could potentially reduce inequalities and improve causal understanding.

METHODS

Linkage

The methods of the SHELS retrospective cohort study have been published in detail (9;13). Using probability matching, 95% of the Census 2001 records were matched to the unique national (Scotland) health identifier, the Community Health Index (CHI), allowing linkage to hospitalisation and death data for 4.65 million. Following a strict protocol of data security and anonymity, health records for gastrointestinal diseases up to 2010 were extracted, linked to the Census and made available without identifiers in a safe haven at National Records Scotland (NRS) to named researchers with appropriate clearance and training.

Data

We used self-reported ethnicity (14 categories), country of birth (categorised as born in the UK and born outside the UK), age, sex and 8 socio-economic indicators (as specified previously (14)) from the 2001 Scottish Census.

To enable sufficient numbers for analysis by ethnicity, we selected four upper GI diseases with more than 1000 hospitalisations per year namely (ICD10 codes): oesophagitis (K20 to K23), peptic ulcer diseases (K25 to K28), gallstone disease (K80 to K83) and pancreatitis (K85 to K87). The corresponding ICD-9 codes were used to identify events prior to 1999.

Small numbers and disclosure issues

Analysis and output production, followed the NRS Disclosure Control Guidance for SHELS and were reviewed by the Disclosure Committee before being released to researchers. According

to the guidance, where the number of events was five and below, data were excluded or aggregated e.g. for peptic ulcer diseases and gallstone disease, we aggregated Bangladeshi with Other South Asian group and joined Caribbean, African and Other Black into one group named 'African origin'. For pancreatitis, the only non-White minority ethnic groups with non disclosive numbers were Indian and Pakistani.

Statistical analysis

We analysed incident events selecting first hospitalisation or death (with no event for the same diagnosis in the previous 10 years) between May 2001 and April 2010. Each specific disease was identified if there was a record of hospitalisation with at least one relevant diagnosis (up to six recorded) or a record of a relevant cause of death (up to 11 recorded).

We calculated the number of person-years (PY) at risk of first event over the period of interest (9 years) and adjusted for any death, transfer out of the NHS Scotland or first event.

We calculated age adjusted rates per 100,000 PY and relative risks (RRs) of first event with 95% confidence intervals (CI) using Poisson regression models with robust. We stratified by sex, adjusted for age and subsequently country of birth (COB). We followed the methods described previously (14) to explore the association between the outcome and eight socio-economic indicators across ethnic group and sex. As it was available widely (0% missing data) and associated consistently with a first upper GI event across ethnic groups and sex (Web appendix table 1), we further adjusted our analysis for the Scottish Index of Multiple Deprivation (SIMD) as a proxy for socioeconomic status. Analysis was restricted to adults (20 years old and over). Comparing to White Scottish men and women, we focussed on the results where the 95% CIs did not include the reference value (100).

Data were analysed using SAS V 9.3 (SAS Institute Inc, Cary, North Carolina, USA).

Ethics

The study was approved by the Multicentre Research Ethics Committee for Scotland (reference 11/MRE00/4) and the Privacy Advisory Committee (PAC). The ethical and other permissions and related issues have been reported in detail (9;13), including an independent assessment by an ethicist (15).

RESULTS

Hospitalisations and deaths

We identified 313,636 patients with any incident upper GI hospitalisation or death linked to the Scottish Census 2001. With nine years of follow-up and 29 million PY at risk, we found 102,706 incident cases of oesophagitis, 44,612 of peptic ulcer disease, 87,556 of gallstone disease and 17,177 of pancreatitis. Most incident events were hospitalisations; the proportion of incident events identified through death records ranged from 0.3% for oesophagitis to 2.0% for pancreatitis.

Characteristics of the study population

The ethnic distribution of our linked Census 2001 population was similar to the general Census population (Web appendix table 2) with an 89% White Scottish majority, 9% other White ethnic groups and 2% non-White ethnic groups. While most Scottish, Irish and Other British were born in the UK (95% to 99%) as well as people from any Mixed Background (75%), it was mixed for all other ethnic groups (34% to 61%). White Scottish, White Irish, Other South Asian and individuals of African origin were more likely to live in more deprived areas in Scotland, whereas the Other White British, Other White, Indian and Chinese ethnicities were more likely to live in the least deprived areas.

Incident upper GI events were identified on average at a younger age for non-White minority ethnic groups (from 48 to 53 years old) compared to White groups (from 59 to 64 years old).

Oesophagitis

For oesophagitis in men, the age-adjusted RRs were higher in White Irish, Pakistani, Bangladeshi and Black Scottish or Other Black men (Table 1). This excess risk was much diminished on adjustment for COB and SIMD in Irish men. Risks were lower in Chinese and Other White men. Differences diminished on adjustment for Other White men. In women, age-adjusted RRs were higher in Indian, Pakistani and Bangladeshi (two fold higher) groups and lower in Other White British, Other White, African and Chinese groups. RRs did not change much on adjustment for SIMD and COB.

Peptic ulcer disease and gastritis

For peptic ulcer disease in men, RRs were higher in White Irish, Other South Asian and Chinese and lower in Other White British, Other White, Pakistani and African origin groups (Table 2). The excess risk in White Irish men diminished on adjustment for COB and SIMD. In women, RRs were higher in White Irish and Other South Asian ethnicities and lower in Other White British, Other White and Indian ethnicities with an attenuation of differences for White Irish and Indian women on adjustment for COB and SIMD.

RRs for gastritis (Web Appendix table 3) were higher in Indian men, Bangladeshi men and Pakistani men and women and lower in Other White British and Other White ethnicities.

Gallstone disease

For gallstone disease in men, RRs were higher in Chinese men and lower in Indian and Other South Asian men, which remained on adjustment for COB and SIMD for Chinese men (Table 3).

In women, RRs were higher in Pakistani and White Irish groups with little change on adjustment for Pakistani women.

Pancreatitis

For pancreatitis in men, RRs were higher in White Irish men and lower in Other White British men (Table 4). The excess risk in Irish men diminished with adjustment for COB and SIMD. In women, RRs were higher in Pakistani group and lower in women of Other White British and Other White ethnicities. Further adjustment for COB and SIMD attenuated the lower risk in Other White British women.

DISCUSSION

Principal findings

Our analysis in the Scottish population has shown interesting variations between ethnic groups for oesophagitis, peptic ulcer disease, gallstone disease and pancreatitis, seen among both White and non-White minority groups. In White groups, adjustment for socio-economic status and country of birth diminished the differences observed in White Irish and other white British men mainly, whereas there was less attenuation on adjustment in non-White groups.

Strengths and limitations

Ethnic variations in upper GI diseases have rarely been studied in the UK (1;4;5;10;11;16). Due to a lack of reliable ethnicity information, previous studies have used country of birth as a proxy (10). SHELS has enabled us to study those diseases based on the self-reported ethnicity in Scotland. The strengths and weaknesses of SHELS have been considered in detail and published (7;13).

A main strength of SHELS is to provide self-defined ethnicity for 4.65 million people, who completed the Scottish Census 2001. The linkage to nine years of hospitalisations and deaths has given robust power to study variation in specific upper GI diseases in most, but not all, minority ethnic groups in Scotland. Our study has shown varied risks between White Scottish and non-White ethnic groups as well as within the White ethnic groups. Our approach, using adjusted person-years (PY) has reduced the potential bias due to loss to follow-up. Linking to the 2001 Census enabled the use of covariates, such as country of birth and socioeconomic status. However, data on *Helicobacter pylori* (*H. Pylori*) infection, nonsteroidal anti-inflammatory drugs (NSAIDs), diet, anthropometrics and other environmental risk factors were not available.

There was incomplete linkage (85% to 95% for ethnic groups) with the risk that some minority ethnic groups may be under-represented in the SHELS cohort. Furthermore, limited number of events in some groups may lead to wide confidence intervals and type 2 statistical errors. The interpretation requires knowledge of the number of tests done, however, there may be differences that we did not observe or highlight due to small numbers, which in part may counterbalance the risk of type 1 statistical error. Hospitalisations and deaths were combined as per our prior data analysis plan, which specified that stratified analysis would take place if deaths comprise 20% or more of the total outcomes.

There may be a lack of accuracy in the self-reporting of ethnic groups as well as in recording upper GI diagnoses on hospital discharge records and cause of death on mortality records. However, whilst the incidence of upper GI disease could be underestimated (or overestimated) due to misclassification, it is unlikely to affect one ethnic group more than another. Differences in health-seeking behaviour may exist between ethnic groups, which might be symptom related e.g. lag time before consulting a doctor about abdominal symptoms or being referred

for investigations. If so, we might expect consistency in the patterns e.g. if the Chinese were low users of health care, they may have low hospitalisation risks for all outcomes. This was not, however the case: peptic ulcer risks were high while other risks were low. Nevertheless, while the variation in patterns by outcome suggests differences in the incidence of disease between different ethnic groups, we acknowledge that differential use of healthcare for diagnosis or treatment in primary care or hospital is an important factor in shaping the patterns.

Findings in relation to the literature

Oesophagitis

Gastro-oesphageal reflux diseases (shortened to GORD or GERD) are usually undiagnosed, even in primary care, hence it is less likely to be recorded for hospitalisations. Some of the ethnic differences in oesophagitis may be due to differences in health seeking behaviours, eg, if certain ethnic groups present more readily with reflux symptoms than others. For example, a time-trends study in the Netherlands found increased rates of reflux oesophagitis in Turkish migrants compared to native Dutch from 1992 to 2009 (17). Systematic reviews showed that GORD symptoms and oesophagitis prevalence are higher in western countries compared to eastern countries, which fits with our finding of lower risks in the Chinese population (18;19). Several population and hospital-based studies have reported oesophagitis (including pre-malignant Barrett's oesophagus) as more common in White populations than Asians and Afro-Caribbean in both the UK and USA (11;16;20;21), which is thought to be related to a protective higher rate of *H. pylori* in non-White groups (22). Our finding of higher risk of oesophagitis in the Pakistani and Bangladeshi populations needs to be interpreted cautiously and requires replication in other large multi-ethnic population studies. Moderately lower oesophagitis risks

in Other White populations have not previously been published and require further exploration in epidemiological studies.

Peptic ulcer disease and Gastritis

Few studies report ethnic differences in peptic ulcer hospitalisation and death internationally. Our study adds to observations on the differences in peptic ulcer hospitalisation between England and Scotland between 1958 and 1972 (4) and higher peptic ulcer death rates in Scottish and Irish migrants in England and Wales in between 1999 and 2003 (10). Compared to the reference White Scottish group, our data suggests a lower risk of peptic ulcer in Other White British and a similar risk in White Irish i.e. Scottish and Irish populations appear to have a similar risk after adjustment for socio-economic status and country of birth.

Our study broadly corroborates other international studies which have assessed ethnic variations in peptic ulcer disease. In the USA, rates of hospitalisation for peptic ulcer disease have been reported to be higher in Blacks and minority ethnic groups compared to Whites in 1998 (23). A study in the United Arab Emirates (UAE) focussing on perforated peptic ulcer found the highest hospitalisation rates in Bangladeshi and Indian compared to people of Arab origin (24). Increased risk of peptic ulcer disease in the Chinese population have been found in cities such as Hong Kong compared to northern Chinese cities (5). Increased rates of *H. Pylori* have also been reported in Chinese ethnicities compared to reference populations in Malaysia and Singapore (25;26). In Scotland, there was a higher risk of peptic ulcer disease in Other South Asians including Bangladeshi populations and in Chinese. However, in contrast, we found the risk of peptic ulcer admission to be lower in men of African origin.

Whether the differences in Scottish, Irish, Other White British and non-White ethnic groups reported are caused by differences in *H. pylori* seroprevalence (28) or NSAID usage continues to be not well understood and remains an important area of future study.

Gastritis is strongly linked to risk factors for peptic ulcer disease and our supplementary analysis show that there are South Asian ethnic groups which appear to be more prone to this. Limited data, from a Malaysian study (*H. Pylori* rates in ulcer, gastritis, duodenitis and non-ulcer dyspepsia at endoscopy were the highest in Bangladeshi and then in Indian and Chinese groups compared to Malay) (29) and in the Netherlands (migrants from Asian and African origins had higher rates of *H. Pylori* infection and atrophic gastritis) (30), corroborate our findings of higher risks observed in Indian, Pakistani and Bangladeshi groups.

Gallstone disease and Pancreatitis

Gallstone disease is very common and is responsible for many hospitalisations in developed countries (31). In the USA, the highest prevalence rates were found in Native Indians followed by Hispanic populations (32). There is, however, a lack of ethnicity data in European populations. The Health Survey for England 2004 on the Health of Minority Ethnic Groups (33) reports 41% and 79% of middle aged (35-54 year old) Pakistani women as respectively obese and overweight, which might partly explain the higher risk of gallstone disease admission in this population in Scotland. However, higher risks in Chinese men are more difficult to explain by known risk factors. Our findings require further confirmation in other population studies including risk factors data.

Corresponding with data on gallstone disease, there is a lack of ethnic-specific data in the UK and Europe on pancreatitis. In the USA, the risk of pancreatitis was 2-3 fold higher among Blacks compared to Whites (34). Our findings of higher risks in Pakistani women in Scotland are novel and, given the high risk of gallstones too, this corroborates the causal links between gallstones and pancreatitis. The prevalence of chronic pancreatitis have been shown to be higher in India and Japan compared to western countries and China (35), but we were unable

to detect such differences in our study due to small numbers. Moderately lower risks in Other White British populations in Scotland could be linked to less alcohol consumption.

Conclusion

We have shown, for the first time in the UK, important ethnic variations in upper GI disorders; health inequalities by ethnic group. The patterns of ethnic variation are seen to be disease dependant, with the moderately sized differences (relative risks up to two-fold) compared to the White Scottish reference. In addition to variations between non-White minority groups, variations were also seen among White subgroups. These novel data on ethnicity are relevant not only to tackling inequalities, health policy and planning, but also as a mean of developing and refining hypotheses of the causes of upper GI diseases.

Acknowledgements, Funding and Independence of researchers

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The researchers acted independently of the funding body and the study sponsor (the University of Edinburgh) at all stages of the work.

Authors' Contributions

The authorship, the authorship byline, and note of contributions follow SHELS policy on authorship.

All authors served on the GI subgroup of SHELS which planned the work in detail. Cézard was the lead writer of this paper and primary analyst, Bhopal was the PI of SHELS, Bansal was the research fellow and co-ordinator of the study, Ward was a collaborator, and Bhala was the chair of the GI subgroup. All authors helped plan the study, evolve analysis plans, interpret data and critically revise successive drafts of the manuscript.

Contributors from the Scottish Health and Ethnicity Linkage Study research team

These contributors served on the Steering Group and some on other important subgroups of SHELS, so gave general direction that helped this analysis. Colin Fischbacher was a co-applicant with lead responsibility for ISD (Information Services Division) involvement. Chris Povey was a co-applicant and the originator of the idea of linking the Census data to the data held by ISD

who performed most of the linkage work including developing linkage methods. Prof Jamie Pearce (co-applicant) advised especially on socio-economic adjustment. Duncan Buchanan (co-applicant) chaired the analysis subgroup. Prof Aziz Sheikh was a co-applicant. Markus Steiner was a research fellow providing support in many aspects of SHELS. Ganka Mueller (part study), Alex Stannard (part study), Stephen Sharp and Kirsty MacLachlan advised particularly in relation to NRS contributions. Anne Douglas coordinated the final phases of this study. These important contributions did not meet ICMJE authorship requirements.

Conflicts of interest

None declared.

Copyright

Data sharing

The data are only available in a data safe haven with restricted access at National Records Scotland, and governed by strict ethical and other restrictions on access. Individual consent for linking these records was not sought. Access to SHELS is not open (yet) but researchers wishing to utilise the data should write to Prof Raj Bhopal.

KEYPOINTS

• Ethnic variations in upper GI disorders were found in the Scottish population using a retrospective cohort design combining hospitalisation and mortality data with reliable measures of ethnicity from national Census; health inequalities by ethnic group.

• The pattern of upper GI disorders varied for each ethnic group, with some disorders being relatively more common and others less common e.g. Chinese populations had higher risks of peptic ulcer disease and lower risks for oesophagitis.

• Ethnic variations were seen both among non-White and among White ethnic subgroups e.g. low-risk in other White British for peptic ulcer disease compared to White Scottish.

• Future research, policy and planning will be able to draw upon these population-based data on ethnic variations to guide more patient centred, effective and efficient clinical care of upper GI diseases.

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Table 1. Age adjusted rates per 100,000 population (PY) and relative risks (RR) for first oesophagitis hospital admission or death, for the population ≥ 20 years by sex and ethnic group. RRs are age, Scottish Index for Multiple Deprivation (SIMD) and Country of Birth (COB) adjusted, with 95% confidence intervals.

Ethnic group	First oesophagitis	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
MEN							
White Scottish	45468	11757152	386.7	100.0	100.0	100.0	100.0
Other White British	3230	1059318	381.8	98.7 (89.5, 108.9)	104.9 (94.2, 116.8)	87.4 (78.2, 97.8)	94.8 (84.5, 106.4)
White Irish	573	143252	492.4	127.3 (114.7, 141.3)	121.9 (107.6, 138.1)	112.1 (99.2, 126.7)	109.7 (96.0, 125.3)
Other White	386	175071	321.3	83.1 (72.0, 95.8)	85.8 (74.8, 98.4)	86.3 (73.6, 101.2)	88.6 (77.2, 101.8)
Any Mixed Background	40	17433	415.4	107.4 (81.8, 141.1)	105.3 (77.7, 142.7)	101.6 (78.4, 131.5)	100.3 (74.6, 134.9)
Indian	75	35114	348.1	90.0 (69.3, 117.0)	97.2 (76.1, 124.3)	95.1 (74.1, 122.0)	101.8 (80.9, 128.2)
Pakistani	176	63708	486.7	125.9 (104.5, 151.5)	126.0 (102.7, 154.5)	132.9 (106.9, 165.2)	132.1 (108.2, 161.1)
Bangladeshi	13	4076	562.0	145.3 (104.2, 202.7)	145.3 (91.9, 229.8)	155.2 (104.0, 231.7)	153.3 (96.5, 243.5)
Other South Asian	33	13415	410.1	106.0 (71.3, 157.8)	106.2 (76.5, 147.3)	112.0 (74.0, 169.4)	111.0 (80.1, 153.7)
Carribean	9	4214	332.9	86.1 (55.5, 133.6)	84.1 (44.9, 157.5)	86.1 (51.3, 144.3)	84.1 (45.9, 154.0)
African	16	11189	283.6	73.3 (49.7, 108.1)	71.1 (43.4, 116.5)	78.3 (58.3, 105.0)	75.2 (46.4, 121.9)
Black Scottish or Other Black	10	2160	688.2	178.0 (103.6, 305.08)	163.7 (92.2, 290.8)	168.5 (97.4, 291.4)	156.2 (86.8, 281.1)
Chinese	47	34763	227.5	58.8 (46.3, 74.8)	61.4 (46.8, 80.6)	63.5 (50.2, 80.2)	65.4 (50.9, 83.9)

Ethnic group	First oesophagitis	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
WOMEN							
White Scottish	47815	13507393	354.0	100.0	100.0	100.0	100.0
Other White British	3264	1161344	299.4	84.6 (76.7, 93.3)	89.0 (79.4, 99.8)	82.7 (73.7, 92.8)	89.1 (79.1, 100.4)
White Irish	638	163816	376.2	106.3 (94.7, 119.2)	101.0 (89.0, 114.6)	103.7 (90.6, 118.7)	101.1 (88.3, 115.8)
Other White	435	212270	255.1	72.1 (63.9, 81.2)	74.9 (64.3, 87.2)	72.8 (63.8, 83.0)	74.9 (64.8, 86.5)
Any Mixed Background	46	21787	317.3	89.6 (74.1, 108.4)	87.1 (68.6, 110.6)	88.8 (69.1, 114.1)	87.2 (67.0, 113.4)
Indian	86	31331	410.2	115.9 (101.5, 132.4)	123.5 (98.1, 155.4)	117.2 (97.4, 141.1)	123.4 (97.6, 156.0)
Pakistani	172	62923	468.2	132.3 (115.4, 151.6)	131.2 (112.9, 152.5)	133.7 (113.0, 158.1)	131.1 (112.1, 153.4)
Bangladeshi	13	3121	733.4	207.2 (132.9, 323.1)	209.2 (127.6, 342.9)	209.4 (129.4, 339.0)	209.1 (124.3, 351.7)
Other South Asian	28	10758	381.0	107.6 (83.8, 138.3)	106.0 (74.0, 151.8)	108.2 (84.2, 139.0)	105.9 (73.1, 153.4)
Carribean	16	4531	483.2	136.5 (96.3, 193.5)	137.4 (88.4, 213.8)	136.5 (86.8, 214.7)	137.4 (84.6, 223.3)
African	13	8467	274.8	77.6 (62.1, 96.9)	74.7 (45.7, 122.2)	78.5 (55.7, 110.7)	74.6 (46.0, 121.1)
Black Scottish or Other Black	7	2401	354.0	100.0 (58.1, 172.2)	93.5 (46.9, 186.5)	98.8 (53.3, 183.2)	93.5 (49.3, 177.5)
Chinese	57	36272	234.8	66.3 (50.7, 86.7)	69.3 (54.2, 88.6)	67.4 (51.6, 88.1)	69.3 (54.5, 88.0)

Table 2. Age adjusted rates per 100,000 population year (PY) and relative risks (RR) for first peptic ulcer hospital admission or death, for the population ≥ 20 years by sex and ethnic group. RRs are age, Scottish Index for Multiple Deprivation (SIMD) and Country of Birth (COB) adjusted, with 95% confidence intervals.

Ethnic group	First peptic ulcer event	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
MEN							
White Scottish	21323	11856156	179.8	100.0	100.0	100.0	100.0
Other White British	1278	1067503	132.7	73.8 (63.1, 86.4)	79.8 (70.4, 90.4)	66.2 (56.3, 77.9)	74.0 (64.2, 85.3)
White Irish	301	144277	222.6	123.8 (101.7, 150.6)	113.8 (94.6, 136.8)	110.4 (89.7, 136.0)	105.0 (86.1, 128.1)
Other White	183	175994	137.1	76.3 (67.0, 86.7)	78.6 (67.8, 91.1)	79.3 (68.6, 91.7)	80.9 (69.4, 94.3)
Any Mixed Background	22	17513	226.4	125.9 (86.2, 183.8)	120.6 (80.2, 181.4)	119.7 (87.7, 163.4)	116.2 (77.3, 174.5)
Indian	32	35309	145.1	80.7 (54.2, 120.2)	89.1 (63.3, 125.4)	85.9 (60.5, 121.9)	93.1 (67.3, 128.6)
Pakistani	53	64202	148.2	82.4 (71.0, 95.6)	81.8 (62.8, 106.5)	87.6 (71.6, 107.3)	85.6 (64.1, 114.3)
Other South Asian	26	17600	256.0	142.4 (120.0, 168.9)	141.2 (107.0, 186.3)	149.8 (105.4, 213.0)	146.0 (106.8, 199.6)
African origin	11	17650	117.0	65.0 (51.5, 82.2)	60.7 (37.4, 98.5)	66.9 (49.9, 89.7)	61.8 (38.7, 98.8)
Chinese	57	34733	279.2	155.3 (121.9, 197.8)	162.3 (126.6, 207.9)	167.2 (136.0, 205.7)	171.0 (131.4, 222.5)

Ethnic group	First peptic ulcer event	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
WOMEN							
White Scottish	19502	13624237	143.1	100.0	100.0	100.0	100.0
Other White British	1163	1170024	111.3	77.8 (64.7, 93.5)	83.4 (71.8, 96.8)	72.1 (59.0, 88.1)	79.9 (67.8, 94.2)
White Irish	317	165235	184.7	129.0 (110.2, 151.1)	118.2 (99.4, 140.5)	118.9 (99.2, 142.6)	113.0 (93.4, 136.6)
Other White	169	213571	106.5	74.4 (56.6, 97.8)	77.9 (63.7, 95.2)	77.4 (60.5, 98.8)	79.6 (65.4, 96.8)
Any Mixed Background	13	21927	101.1	70.6 (41.7, 119.6)	67.0 (41.1, 109.2)	68.2 (37.9, 122.7)	65.6 (38.1, 112.9)
Indian	17	31631	97.6	68.2 (47.3, 98.3)	73.9 (50.8, 107.6)	71.4 (46.4, 109.9)	75.8 (50.8, 113.3)
Pakistani	49	63384	167.5	117.0 (91.1, 150.2)	115.4 (90.9, 146.4)	122.4 (97.7, 165.1)	118.4 (91.4, 153.5)
Other South Asian	18	13984	233.7	163.3 (123.8, 215.2)	159.0 (99.2, 255.0)	166.3 (106.1, 260.5)	160.5 (101.8, 252.9)
African origin	14	15529	167.9	117.3 (63.4, 216.9)	112.1 (66.1, 189.9)	118.3 (68.3, 204.9)	112.6 (63.8, 199.0)
Chinese	32	36393	159.4	111.4 (78.6, 157.8)	117.0 (80.1, 171.0)	118.5 (78.8, 178.1)	121.2 (82.5, 177.8)

Table 3. Age adjusted rates per 100,000 population year (PY) and relative risks (RR) for first gallstones hospital admission or death, for the population ≥ 20 years by sex and ethnic group. RRs are age, Scottish Index for Multiple Deprivation (SIMD) and Country of Birth (COB) adjusted with 95% confidence intervals.

Ethnic group	First gallstones event	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	**Age, SIMD and COB adjusted RR and 95% CI
MEN							
White Scottish	24433	11853134	206.1	100.0	100.0	100.0	100.0
Other White British	1907	1065238	197.5	95.8 (86.8, 105.7)	98.8 (88.8, 109.9)	89.5 (80.4, 99.6)	93.5 (82.8, 105.7)
White Irish	295	144469	216.7	105.1 (93.0, 118.8)	101.4 (87.3, 117.7)	97.9 (85.8, 111.6)	95.7 (81.4, 112.6)
Other White	264	175746	199.6	96.8 (81.5, 115.1)	98.0 (83.9, 114.6)	99.2 (83.1, 118.4)	100.0 (85.3, 117.3)
Any Mixed Background	30	17497	313.8	152.2 (97.6, 237.5)	149.5 (100.2, 223.1)	147.6 (99.2, 219.4)	145.7 (96.7, 219.6)
Indian	36	35270	164.4	79.7 (64.5, 98.5)	83.2 (65.5, 105.5)	82.9 (67.5, 101.9)	85.8 (67.7, 108.9)
Pakistani	80	64188	225.0	109.1 (85.2, 139.8)	108.8 (88.2, 134.2)	113.6 (87.7, 147.1)	112.4 (89.9, 140.6)
Other South Asian	16	17632	158.0	76.6 (59.6, 98.6)	76.5 (49.9, 117.4)	79.1 (58.1, 107.7)	78.4 (49.9, 123.4)
African origin	14	17628	149.5	72.5 (43.7, 120.4)	70.5 (45.7, 108.8)	73.8 (44.4, 122.9)	71.5 (44.3, 115.4)
Chinese	56	34756	275.9	133.8 (116.1, 154.2)	136.4 (102.3, 181.8)	140.2 (117.5, 167.2)	141.6 (105.9, 189.2)

Ethnic group	First gallstones event	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
WOMEN							
White Scottish	54754	13489747	405.9	100.0	100.0	100.0	100.0
Other White British	3841	1159683	400.6	98.7 (91.1, 106.9)	102.5 (95.7, 109.9)	93.2 (85.8, 101.2)	98.5 (91.3, 106.2)
White Irish	655	163958	456.7	112.5 (101.2, 125.1)	107.8 (99.0, 117.3)	105.8 (94.9, 118.0)	103.2 (94.2, 113.0)
Other White	576	211812	358.0	88.2 (75.2, 103.4)	90.8 (81.2, 101.6)	90.9 (78.7, 105.2)	92.8 (82.9, 103.9)
Any Mixed Background	54	21787	357.1	88.0 (63.9, 121.1)	85.8 (69.9, 105.3)	86.0 (64.0, 115.5)	84.4 (68.2, 104.3)
Indian	89	31328	410.0	101.0 (78.1, 130.6)	106.0 (84.9, 132.5)	103.5 (81.1, 132.1)	107.9 (87.1, 133.6)
Pakistani	214	62803	521.3	128.4 (116.3, 141.9)	126.6 (113.3, 141.4)	131.3 (115.4, 149.4)	128.6 (112.1, 147.6)
Other South Asian	39	13909	406.1	100.0 (65.0, 154.0)	98.7 (74.7, 130.5)	102.1 (66.4, 157.1)	100.1 (75.5, 132.8)
African origin	38	15413	359.9	88.7 (67.6, 116.2)	85.5 (66.8, 109.6)	89.8 (65.7, 122.9)	86.4 (65.1, 114.5)
Chinese	95	36134	379.7	93.5 (73.7, 118.7)	96.9 (80.1, 117.3)	97.7 (78.1, 122.2)	100.0 (82.1, 121.8)

Table 4. Age adjusted rates per 100,000 population year (PY) and relative risks (RR) for first pancreatitis hospital admission or death, for the population ≥ 20 years by sex and ethnic group. RRs are age, Scottish Index for Multiple Deprivation (SIMD) and Country of Birth (COB) adjusted, with 95% confidence intervals.

Ethnic group	First pancreatitis event	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
MEN							
White Scottish	7615	11908706	63.9	100.0	100.0	100.0	100.0
Other White British	428	1070471	46.8	73.1 (62.0, 86.2)	78.7 (67.1, 92.4)	64.4 (53.4, 77.7)	71.0 (58.9, 85.4)
White Irish	101	145093	79.9	124.9 (103.9, 150.2)	115.0 (91.2, 145.1)	109.1 (88.3, 134.8)	103.0 (80.0, 132.7)
Other White	78	176355	59.9	93.7 (68.3, 128.6)	96.5 (74.1, 125.7)	102.4 (75.6, 138.9)	103.9 (80.6, 134.0)
Any Mixed Background	10	17559	94.5	147.7 (90.1, 242.3)	140.8 (80.0, 247.7)	141.9 (87.5, 230.3)	135.8 (76.0, 242.7)
Indian	18	35336	76.5	119.6 (76.3, 187.5)	131.6 (84.4, 205.2)	134.0 (89.8, 199.8)	144.2 (91.7, 226.8)
Pakistani	20	64367	50.0	78.1 (51.5, 118.6)	76.8 (53.4, 110.5)	87.4 (58.8, 129.9)	84.4 (57.9, 123.2)

Ethnic group	First pancreatitis event	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
WOMEN							
White Scottish	8127	13668464	59.5	100.0	100.0	100.0	100.0
Other White British	515	1172400	49.5	83.2 (71.5, 96.9)	87.5 (76.3, 100.4)	84.3 (71.6, 99.3)	90.4 (76.9, 106.3)
White Irish	81	166077	49.6	83.5 (69.6, 100.1)	78.4 (63.7, 96.5)	84.7 (69.3, 103.4)	81.2 (64.9, 101.7)
Other White	71	213849	42.3	71.1 (55.1, 91.6)	73.7 (56.6, 95.9)	70.3 (54.1, 91.3)	71.6 (54.5, 94.1)
Any Mixed Background	11	21946	73.5	123.6 (75.2, 203.1)	119.2 (76.2, 186.7)	124.0 (75.4, 203.8)	120.4 (73.8, 196.4)
Indian	15	31649	71.4	120.0 (89.0, 161.8)	127.6 (85.6, 190.4)	118.7 (84.1, 167.7)	124.3 (81.8, 188.9)
Pakistani	35	63485	91.1	153.3 (130.3, 180.2)	150.9 (114.6, 198.8)	151.7 (123.3, 186.6)	147.1 (108.8, 198.8)

Appendix table 1: Strength of association between 8 socio-economic indicators and the incidence of upper GI diseases for each sex and ethic group

Sex and ethnic group	SIMD	Highest qualification (individual)	Highest qualification (household)*	NS-SeC (individual)**	NS-SeC (household)*	Car Owership	Household Tenure	Activity last week
	quantitative	*quantitative*	*quantitative*	*quantitative*	*quantitative*	*1+ vs. 0*	*Owned vs. Rented*	*Working vs. Inactive*
MEN								
White Scottish	13.1 [11.2;14.9]	22.7 [17.4;27.7]	20.6 [14.7;26]	15.5 [12.7;18.2]	16 [13.6;18.4]	31 [24.5;37]	31 [24.4;37]	46 [38.3;52.7]
Other White British	14.1 [11.3;16.9]	23.4 [18.9;27.7]	23.5 [19.7;27.2]	17.4 [15.3;19.3]	18.1 [14.7;21.3]	26.3 [19.7;32.5]	26.8 [18.1;34.5]	38.6 [30.7;45.6]
White Irish	17.2 [12.7;21.4]	28.8 [21.3;35.6]	22.4 [10.2;32.9]	24.6 [19.4;29.6]	21.1 [14.2;27.5]	27.2 [8.5;41.9]	37.3 [22.6;49.2]	48 [32.1;60.2]
Other White	15.3 [10.7;19.7]	19.3 [13.8;24.5]	20 [13.7;25.8]	17.8 [12.6;22.8]	21 [17.3;24.5]	23.2 [12.1;32.9]	12.9 [0;24.2]	42.2 [30.6;52]
Any Mixed Background	19.7 [8.5;29.5]	25.2 [0.5;43.7]	31.5 [9.5;48.1]	31.3 [17.9;42.6]	29.5 [20.5;37.6]	29.4 [8.9;45.3]	39.6 [24.8;51.5]	48.1 [45.8;50.3]
Indian	9.5 [2;16.5]	15.2 [-2.3;29.7]	11.9 [-5;26.1]	21.1 [-1.5;38.7]	15.7 [1.7;27.6]	18.6 [-7.2;38.1]	-18.5 [-48.7;5.5]	38.3 [34.6;41.9]
Pakistani	7.7 [3;12.2]	12.4 [-7;28.3]	4.2 [-11.7;17.7]	3 [-8.3;13.3]	7 [2.5;11.3]	-18.4 [-34;-4.5]	22 [3.9;36.7]	20.9 [-4.2;39.9]
Other South Asian	12.3 [6.3;18]	16.8 [5.8;26.5]	21.7 [10.9;31.3]	0.4 [-17.3;15.5]	4.2 [-5.7;13.2]	-2 [-31.7;21]	11.3 [-26;37.6]	3 [-31.3;28.5]
Black	12.9 [5.3;19.9]	43.2 [35.2;50.2]	30.5 [21;38.8]	10.1 [-7.5;24.9]	13.3 [-1.5;26]	31.1 [15.6;43.7]	53.1 [44.1;60.7]	44.7 [15.2;64]
Chinese	1.2 [-6.5;8.3]	26.9 [6.4;42.9]	22 [8.3;33.7]	12.7 [0.5;23.4]	11.5 [2.9;19.4]	14.3 [0.9;25.8]	25.6 [3.2;42.8]	-20.2 [-68.5;14.2]
WOMEN								
White Scottish	13.1 [11.4;14.8]	23.2 [18.5;27.6]	20.5 [15.8;24.9]	16.3 [13.9;18.7]	16.7 [14.6;18.7]	22.5 [18.8;26.1]	27.7 [22.3;32.7]	37.7 [33.4;41.8]
Other White British	15.4 [12.9;17.9]	25.9 [19.8;31.6]	25.3 [18.5;31.6]	17.7 [13.5;21.7]	20.9 [16.7;24.8]	21 [15.1;26.4]	24.1 [16.8;30.8]	29.1 [25.2;32.9]
White Irish	13.2 [10;16.3]	19.5 [13.8;24.9]	20 [14.4;25.2]	15.8 [9.7;21.5]	18 [14.7;21.3]	18.4 [12.6;23.8]	21.9 [7.7;33.8]	37.8 [28.5;45.8]
Other White	17.5 [13.4;21.4]	22.8 [19.1;26.4]	22.4 [16.4;28]	16.2 [9;22.8]	18.1 [11.7;23.9]	20.6 [8.5;31]	14.6 [1.7;25.9]	36.1 [31.2;40.6]
Any Mixed Background	16.7 [11.6;21.5]	17.4 [0.7;31.2]	29.1 [19.9;37.3]	5.4 [-9;18.1]	18 [10;25.2]	26.1 [1.2;44.8]	26.6 [14.6;36.9]	36.7 [30.6;42.3]
Indian	1.5 [-3.4;6.3]	25.3 [13.6;35.3]	15 [-0.5;28.2]	13.3 [3;22.5]	4.9 [-3.5;12.6]	-33.2 [-82.1;2.5]	-27.5 [-59.9;-1.5]	27.6 [8;43]
Pakistani	4 [-1.9;9.5]	29.1 [23;34.8]	13.1 [6.5;19.2]	15 [10.6;19.3]	3.9 [-2.5;10]	-3.5 [-16.7;8]	12.7 [-3.9;26.7]	23.3 [19;27.5]
Other South Asian	2.5 [-4.3;9]	28.2 [13.3;40.5]	20.7 [8.5;31.2]	15.4 [-5.2;32.1]	19.4 [7.2;30.1]	9.5 [-1.8;19.5]	5.8 [-19.6;25.8]	43.8 [29;55.6]
Black	9.8 [0.5;18.3]	26.3 [17.3;34.3]	36.4 [31.1;41.3]	15.6 [5.7;24.4]	15.3 [5.7;23.9]	0.2 [-22.8;19.1]	11.7 [0.5;21.6]	16.7 [6.4;25.9]
Chinese	13.7 [5;21.4]	43.3 [35.7;50.1]	33.1 [15.5;47.1]	22.8 [14.5;30.3]	21 [13.3;28]	30.9 [17.7;42.1]	25.3 [6.3;40.4]	40 [29.6;48.9]

Appendix table 2: Socio-demographic profile of the linked Census population by sex

Sex and ethnic group	N	Age at Census		Country of Birth	SIMD		Highest Qualification (individual)	NS- SeC (individual)
		(mean, STD)		*UK born (%)*	*Most Deprived (%)*	*Least Deprived (%)*	*High (%)*	*Managerial (%)*
MEN								
White Scottish	1949484	38	(22)	99.1	20.1	19.8	24.4	45.6
Other White British	160235	42	(20)	95.3	8.0	29.6	48.4	64.3
White Irish	20341	45	(20)	98.4	22.2	21.7	36.8	57.3
Other White	29944	36	(21)	30.5	12.4	32.6	49.2	63.6
Any Mixed Background	5310	21	(18)	76.0	19.7	26.1	36.8	56.2
Indian	6448	31	(19)	48.4	9.7	38.5	50.9	55.1
Pakistani	12929	27	(19)	58.0	15.8	24.8	26.5	31.9
Other South Asian	3549	29	(19)	38.9	24.2	28.3	46.4	43.5
African origin	3277	30	(18)	39.9	27.6	22.4	52.4	56.8
Chinese	6532	30	(18)	38.4	13.4	38.5	31.8	34.7
WOMEN								
White Scottish	2138643	41	(24)	99.1	21.3	19.2	23.8	30.4
Other White British	174748	44	(21)	95.0	8.2	28.9	40.8	43.6
White Irish	23162	49	(21)	98.6	20.1	22.8	38.0	47.9
Other White	35711	37	(21)	26.4	10.8	33.4	51.3	47.0
Any Mixed Background	5799	24	(20)	74.5	18.7	27.3	37.8	40.0
Indian	5888	30	(19)	51.1	9.6	39.0	40.7	32.5
Pakistani	12702	26	(18)	60.5	15.4	24.6	22.8	12.8
Other South Asian	2963	29	(20)	44.5	22.0	28.9	36.7	25.8
African origin	3056	30	(18)	42.1	27.5	24.5	46.1	36.5
Chinese	6672	31	(18)	33.9	12.1	39.1	33.3	23.9

Appendix table 3. Age adjusted rates per 100,000 population year (PY) and relative risks for first gastritis hospital admission or death, for the population ≥ 20 years by sex and ethnic group. RRs are age, Scottish Index for Multiple Deprivation (SIMD) and Country of Birth (COB) adjusted, with 95% confidence intervals.

Ethnic group	First gastritis event	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
MEN							
White Scottish	57614	11712661	491.9	100.0	100.0	100.0	100.0
Other White British	3860	1057152	393.1	79.9 (73.2, 87.3)	86.1 (78.0, 95.1)	72.9 (65.9, 80.7)	80.6 (72.5, 89.7)
White Irish	779	142514	577.8	117.5 (105.4, 130.8)	111.6 (100.1, 124.4)	106.7 (94.5, 120.6)	104.1 (92.5, 117.1)
Other White	531	174615	383.1	77.9 (66.5, 91.3)	81.1 (71.1, 92.5)	80.2 (68.0, 94.4)	82.8 (72.6, 94.4)
Any Mixed Background	58	17369	518.2	105.4 (80.6, 137.6)	102.9 (78.8, 134.3)	101.1 (80.1, 127.6)	99.7 (77.3, 128.6)
Indian	156	34802	628.2	127.7 (114.8, 142.1)	140.3 (116.8, 168.5)	133.2 (119.5, 148.4)	144.6 (119.0, 175.9)
Pakistani	238	63513	564.0	114.7 (104.1, 126.3)	114.9 (100.4, 131.4)	119.5 (103.0, 138.7)	118.6 (102.1, 137.7)
Bangladeshi	18	4056	670.4	136.3 (112.4, 165.2)	136.4 (83.9, 221.8)	143.1 (114.9, 178.3)	141.2 (86.0, 231.8)
Other South Asian	50	13374	536.2	109.0 (83.2, 142.8)	109.3 (84.4, 141.5)	113.6 (85.2, 151.4)	112.5 (85.1, 148.7)
Carribean	14	4198	450.6	91.6 (57.5, 146.0)	88.9 (56.0, 141.4)	91.7 (58.2, 144.5)	89.0 (55.3, 143.2)
African	20	11159	307.4	62.5 (49.6, 78.8)	60.2 (39.7, 91.4)	65.6 (49.3, 87.3)	62.5 (40.4, 96.6)
Black Scottish or Other Black	9	2153	542.4	110.3 (60.7, 200.3)	99.1 (55.8, 176.0)	105.7 (57.8, 193.1)	95.9 (50.8, 181.2)
Chinese	106	34532	444.1	90.3 (79.2, 103.0)	95.0 (74.8, 120.7)	95.5 (81.3, 112.2)	99.0 (77.9, 125.9)

Ethnic group	First gastritis event	PY at risk	Age-adjusted rates (for 100,000 PY)	Age adjusted RR and 95% CI	Age and SIMD adjusted RR and 95% CI	Age and COB adjusted RR and 95% CI	Age, SIMD and COB adjusted RR and 95% CI
WOMEN							
White Scottish	70513	13418993	525.5	100.0	100.0	100.0	100.0
Other White British	4695	1155422	412.6	78.5 (70.9, 87.0)	83.4 (76.0, 91.5)	75.8 (68.3, 84.1)	82.5 (75.0, 90.8)
White Irish	967	162704	554.4	105.5 (94.0, 118.4)	99.8 (90.1, 110.7)	101.6 (90.1, 114.5)	98.8 (88.8, 109.9)
Other White	695	211278	383.4	73.0 (63.0, 84.6)	76.4 (67.4, 86.7)	74.1 (64.0, 85.8)	76.8 (68.2, 86.4)
Any Mixed Background	72	21723	453.8	86.4 (67.8, 109.9)	83.7 (66.0, 106.0)	85.1 (68.6, 105.6)	83.3 (65.8, 105.4)
Indian	144	31101	626.8	119.3 (98.6, 144.3)	128.3 (109.6, 150.0)	121.3 (98.3, 149.7)	128.9 (108.7, 152.8)
Pakistani	326	62262	794.2	151.1 (127.3, 179.4)	149.5 (126.9, 176.1)	153.6 (127.7, 184.6)	150.2 (128.7, 175.4)
Bangladeshi	15	3118	745.5	141.9 (71.8, 280.5)	142.4 (86.2, 235.5)	144.3 (78.1, 266.5)	143.1 (87.3, 234.6)
Other South Asian	40	10691	499.2	95.0 (71.6, 126.0)	93.5 (69.7, 125.4)	95.8 (71.3, 128.8)	93.7 (70.0, 125.5)
Carribean	18	4544	498.5	94.9 (50.2, 179.2)	95.5 (56.7, 160.8)	94.8 (56.0, 160.4)	95.5 (59.0, 154.5)
African	23	8429	430.4	81.9 (60.3, 111.3)	78.1 (56.2, 108.6)	83.5 (55.5, 125.6)	78.6 (55.1, 112.2)
Black Scottish or Other Black	13	2382	618.0	117.6 (75.2,. 184.0)	109.2 (64.0, 186.3)	115.5 (74.6, 178.7)	108.6 (66.3, 178.1)
Chinese	143	35922	540.2	102.8 (81.8, 129.1)	108.3 (91.7, 127.8)	105.5 (86.5, 128.6)	109.1 (92.0, 129.4)