

Background Compared to UK white European adults, UK black African-Caribbean adults have higher mean systolic (SBP) and diastolic (DBP) blood pressure; UK South Asian adults have higher mean DBP but lower SBP. However, information on blood pressure in UK children from different ethnic groups is limited. The aim of this study was to compare blood pressure levels in UK children of black African-Caribbean, South Asian and white European origin.

Methods A cross sectional study of 5,666 UK primary school children of South Asian, black African Caribbean, and white European origin aged 9 to 10 years was undertaken. Ethnic and socioeconomic differences in SBP and DBP (as means and differences with their 95% confidence intervals) were obtained from multilevel linear regression models fitting school as a random effect in order to take account of the natural clustering of children within school. All analyses were adjusted for sex, age, month of assessment, blood pressure observer, room temperature and time of day of measurement fitted as fixed effects. The effects of adjustment for height, adiposity (fat mass index, sum of skinfolds) fitted as continuous variables, and socioeconomic circumstances on ethnic differences in blood pressure were then explored.

Results After adjustment for height and adiposity, black African-Caribbean children had a lower mean SBP than white Europeans (mean difference 1.62 mmHg, 95% CI 0.86, 2.38 mmHg), while mean DBP was similar (mean difference 0.58 mmHg, 95%CI -0.12, 1.28 mmHg). The mean SBP difference was particularly marked in black African children. In similar analyses, South Asian children had a lower mean SBP (mean difference 1.10 mmHg, 95%CI 0.34, 1.86 mmHg) than white Europeans and a higher mean DBP (mean difference 1.07 mmHg, 95%CI 0.37, 1.76 mmHg). The mean DBP difference was particularly marked among Indian and Bangladeshi, rather than Pakistani, children. Blood pressure was largely unrelated to socioeconomic circumstances; the ethnic differences in blood pressure were not affected by socioeconomic adjustment.

Conclusion A blood pressure pattern similar to that in adults is present in UK South Asian but not in UK black African-Caribbean children at 9–10 years. This suggests that key determinants of ethnic differences in blood pressure operate at different stages of the life course in these different ethnic groups. Understanding the reasons for the early emergence of ethnic differences in blood pressure (particularly among South Asians) is an important research priority.

OP30 ARE THE ASSOCIATIONS BETWEEN ADIPOSITY, INSULIN RESISTANCE AND CIRCULATING GLUCOSE CONCENTRATIONS IN CHILDHOOD INFLUENCED BY ETHNICITY? EVIDENCE FROM THE CHILD HEART AND HEALTH STUDY IN ENGLAND (CHASE)

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Background Ethnic differences in type 2 diabetes risk between South Asians and white Europeans originate before adult life. Although South Asian adults have greater metabolic sensitivity to adiposity this has been little studied in childhood. We have therefore examined the associations between adiposity, insulin and glycated haemoglobin (HbA1c) levels in children of South Asian and white European origin. Data on children of black African-Caribbean origin are also reported.

Methods This was a cross-sectional school-based study of 4633 nine and ten year-old children (response rate 68%) predominantly of South Asian, black African-Caribbean and white European origin. Participants had detailed assessments of adiposity (including body mass index, skinfold thicknesses and fat mass index from

bioimpedance) and provided fasting blood samples for assessment of HbA1c and insulin resistance (Homeostatic model assessment-insulin resistance; HOMA-IR). Associations between HOMA-IR (log transformed), HbA1c and adiposity markers were estimated using multilevel linear regression.

Results All adiposity measures were positively associated with insulin resistance in all ethnic groups. However there were clear ethnic differences in the strength of association (p ethnic difference <0.001). The percentage increase in HOMA-IR for a one SD increase in fat mass index was 36.3% (95% CI 32.1%, 40.5%) for South Asians and 25.1% (95% CI 21.1%, 29.3%) for white Europeans; black African-Caribbeans were similar to white Europeans (26.4%, 95% CI 22.5%, 30.4%). All adiposity markers were positively associated with HbA1c in both South Asians and black African-Caribbeans: the percentage increase in HbA1c for a one SD increase in fat mass index in was 0.04% (95% CI 0.02%, 0.06%) in both ethnic groups. However there was no association among white Europeans (0.01%, 95% CI 0.00%, 0.03%).

Conclusion Even in childhood, both insulin resistance and HbA1c levels appear more sensitive to adiposity in South Asians. Among children of black African-Caribbean origin, HbA1c levels but not insulin resistance appear more sensitive to adiposity. The reasons for these differences in sensitivity to adiposity need to be understood. The results imply that early prevention of childhood obesity among South Asians and black African-Caribbeans is a particular priority for future control of type 2 diabetes in these high risk ethnic groups.

OP31 ETHNIC DIFFERENCES IN THE DEVELOPMENT OF DISABILITY OVER 20 YEARS: RESULTS FROM THE SABRE STUDY

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Background As life expectancy increases, healthy ageing becomes more salient, and therefore it is important to understand how conditions such as disability may affect the later years of our extended lives. Ethnic differences in disability have been observed in some countries, however there is a lack of evidence from British ethnic groups.

Methods Follow-up data over 20 years from 1789 White, Indian Asian and African Caribbean men and women were examined from a community-based study in West London. Disability was measured using the performance-based test of locomotor function and self-reported functional limitation, instrumental and basic activities of daily living (IADL/ADL) questionnaires. Logistic regression analyses examined ethnic group differences in disability, adjusting for socioeconomic, behavioural, adiposity and chronic disease risk factors.

Results After full adjustment, Indian Asian people were significantly more likely to have developed all of the disability outcomes, compared with UK Whites (locomotor dysfunction: OR 2.20, 95% CI 1.56–3.11; functional limitation: OR 2.77, 2.01–3.81; IADL impairment: OR 3.12, 2.20–4.41; ADL impairment: OR 1.56, 1.11–2.24). Health behaviours, central adiposity, and chronic disease burden explained only a proportion of this excess risk. There were no ethnic group differences in locomotor dysfunction, functional limitation and IADL impairment between African Caribbean and White participants, however African Caribbean people showed a reduced risk of ADL impairment (OR 0.59, 0.38–0.93), after multivariate adjustment.

Conclusion These findings demonstrate dramatic ethnic group differences in performance-based and self-reported disability between White, Indian Asian, and African Caribbean people in the UK. The excessive risk experienced by Indian Asian people was partly explained by health behaviours, adiposity, and chronic

disease, however considerable inequalities remained. Other possible explanations for this vulnerability to disability among Indian Asian people will be discussed. Such inequalities are likely to have a detrimental impact on quality of life and morbidity in later years, and therefore, more research is urgently needed to understand these large ethnic inequalities in disability.

OP32 HEALTH INEQUALITIES IN JAPAN 1986 TO 2007 BASED ON SELF-RATED HEALTH, HOUSEHOLD INCOME AND A NOVEL OCCUPATIONAL CLASSIFICATION

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Background While widening or stable inequalities have often been found in relation to economic stagnation in the west, time trends in health inequalities in Japan over the past two decades of economic stagnation are unclear. Comprehensive examination of temporal trends and factors contributing health inequalities in Japan are imperative to population health.

Methods We analysed a series of eight nationally-representative samples (Comprehensive Survey of the Living Conditions of People on Health and Welfare) between 1986 and 2007 (n=398,303). We used household income and a novel theory-driven occupational social class classification to calculate temporal trends in relative and slope indices of inequality [RII and SII, respectively] in self-rated fair or poor health. Multiple imputation was conducted to account for missing income data. Effects of living conditions, behavioural and psychosocial factors were tested using 1998 and 2001 samples.

Results Overall, age-standardised self-rated fair or poor health showed U-shaped time trends in both sexes (quadratic term: men $p < 0.001$, women $p = 0.005$), with the lowest prevalence in early/mid 1990s. In men, income RII and SII narrowed significantly over the period (RII declined 1.4% per year, $p = 0.001$; SII declined 0.1% per year, $p = 0.031$). Inequalities in women's income were stable (RII and SII). The two indices showed constant inequalities across occupational social class in both sexes. After multiple imputation, point estimates became smaller, and narrowing of income inequality over time was significant for RII and SII in both sexes ($p < 0.05$, $n = 490,632$). The annual declines were 1.4% and 1.0% for RII in men and women, respectively, and 0.1% for SII in both sexes. Living conditions, behavioural and psychosocial factors accounted for 28% of men's and 51% of women's health inequalities in Japan.

Conclusion Health inequalities in Japan either narrowed or remained stable from 1986 to 2007, in contrast to studies in western countries. The evidence provided by these analyses suggests that the prolonged economic stagnation in Japan had adverse effects at both ends of socioeconomic hierarchy. Potential explanations include effects of decreased income and increased stress in relation to job insecurity and workload across socioeconomic groups.

Public Health Interventions: Transport

OP33 EXPOSURE-BASED ASSESSMENT OF MODAL TRAVEL RISK IN ENGLAND USING ROUTINE HEALTH DATA

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Background Cycling can make large contributions to population health but perceived road danger is a strong disincentive to cycling. Research on cycling safety is distorted by not making like-for-like comparisons. We examined age- and sex-specific deaths and injuries

in England by travel mode, considering both the ICD external codes included in official travel risk data and those excluded but required for accurate comparative assessment, to provide more precise comparisons of travel risks by mode.

Methods ICD-10 external codes were grouped by type of incident for pedestrians, cyclists, and car/van drivers; the fourth digit was used to exclude non-transport casualties. Numbers of hospital admissions, from Hospital Episodes Statistics data, and deaths in England 2007–2009 were obtained for these ICD codes, by age-group and sex. Aggregated per capita distance travelled by age-group, sex and mode in England from National Travel Survey for each year 2007–2009, weighted to be nationally-representative, was multiplied by the estimated mid-year population. Time spent travelling was estimated using mean trip speeds by mode. We calculated fatal injury and hospital admission rates by distance travelled and by time spent travelling by age-group, sex, and travel mode. 95% confidence intervals for Poisson parameters were calculated using the formulae for weighted sums.

Results Fatalities per million hours' use (£/mhu) varied little (0.15–0.45£/mhu by mode for men, 0.09–0.31£/mhu for women). Risks were similar for men aged 21–49 years for all three modes and for female pedestrians and drivers aged 21–69 years. The group most at risk for each mode were: male drivers aged 17–20 years (1.3£/mhu, 95% CI 1.2, 1.4); male cyclists aged 70 years or older (2.2 £/mhu, 1.6, 3.0) and female pedestrians aged 70 years or older (0.95 £/mhu, 0.86, 1.1). In general, fatality rates were substantially higher amongst males than females, except for drivers aged 60 years or older. Risks per hour for male drivers under 30 years were similar or higher than for male cyclists; for 17–20 year olds the risk was higher for drivers (33/Bn km, 95% CI 30, 36; 1.3£/mhu, 1.2, 1.4) than cyclists (20/Bn km, 10, 37; 0.24£/mhu, 0.12, 0.45) using distance or time.

Conclusion This is the first study in the UK to provide travel casualty rates by distance travelled and per hour, by mode, by age-group and sex, based on nationally-representative data, to enable unbiased intermodal comparisons for population sub-groups. Males aged 17–20 years old face higher risks as drivers than as cyclists, and do not achieve better safety as drivers until over 30 years. Not making like-for-like comparisons sustains the misleading stereotype that cycling is relatively hazardous.

OP34 INEQUITIES IN BICYCLE USAGE: SOCIO-DEMOGRAPHIC PREDICTORS OF UPTAKE AND USAGE OF A PUBLIC BICYCLE SHARING SCHEME IN LONDON, UK

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Background Cycling confers individual and population-level health benefits. Increasing numbers of cities are therefore introducing public bicycle sharing schemes, with London's Barclays Cycle Hire (BCH) scheme introduced in July 2010. Yet uptake of cycling is not equitable across socio-demographic groups. We sought to examine the characteristics of the BCH scheme's registered users, and to explore characteristics associated with usage.

Methods For users registering in the first seven months of the scheme, we obtained complete BCH registration and usage data, comprising: title (from which we inferred gender); home postcode; date of registration; access type; and number of trips made. We used postcodes to calculate distance to the nearest 'docking station' and to assign small-area-level data on ethnic composition, income deprivation, and the prevalence of commuter cycling. We compared characteristics of registered users with local residents and workers in the inner-London area served by the scheme. We used multi-level linear regression to examine correlates of 'mean number of trips', and logistic regression to examine correlates of 'ever use'.