

body composition; a multiplicative interaction term for AC growth from 34 weeks to birth and 6 year prudent diet score was added. Confounding variables (determined by a Directed Acyclic Graph) were 9-year height, age at DXA, sex, breast-feeding duration, maternal BMI, education, smoking in pregnancy, late pregnancy vitamin D and pregnancy weight gain.

**Results** Greater AC growth z-scores from birth to 6 months, 2–3 years and 3–6 years were associated with higher fat mass and percentage fat at 9 years. The interaction between AC growth from 34 weeks to birth and 6 year prudent diet score was statistically significant for total fat ( $p=0.006$ ) and percentage fat ( $p=0.005$ ), but not for total lean or bone mass. Amongst children with low late gestation AC growth, lower prudent diet scores were associated with greater 9-year total and percentage fat, whereas amongst children with high AC growth in late gestation there was little effect of prudent diet score on total and percentage fat.

**Conclusion** Individuals showing late gestation faltering of fetal growth who then had an unhealthy imprudent childhood diet had greater adiposity, while childhood diet was less influential on adiposity in individuals whose fetal growth had not faltered, providing evidence in support of the mismatch hypothesis.

OP40

#### #ASSOCIATION BETWEEN SUPERMARKET CHECKOUT FOOD POLICIES AND PURCHASES OF COMMON LESS HEALTHY CHECKOUT FOODS: INTERRUPTED TIME SERIES ANALYSES AND META-ANALYSIS OF NATURAL EXPERIMENTS

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**Background** Supermarkets' in-store marketing influences food purchasing and consumption. This marketing includes positioning food at checkouts. Checkouts provide a unique location, through which all customers must pass and where some may linger. The majority of supermarket checkout food is less healthy.

Supermarket activities with potential to improve population health are increasing. One example is voluntary, supermarket-led policies on checkout foods.

We studied the immediate and sustained impacts of the introduction of voluntary, supermarket-led checkout food policies on purchases of commonly displayed checkout foods.

**Methods** Eight national supermarket groups were included. Intervention groups were those that changed their checkout food policy between January 2014 and February 2016 ( $n=6$ ).

Supermarket group-specific data on purchases of common checkout foods was obtained from Kantar Worldpanel's 'Take Home' panel: a representative panel of UK households ( $n\approx 30,000$ ) who record all food and beverage purchases brought into the home. We obtained data at the four-weekly level, multiplied up and weighted by Kantar to represent the total UK market. Kantar also provided supermarket group market share data.

Common checkout foods, selected based on a previous survey, were: single-unit packages of sugary confectionery ( $\leq 225$  g), chocolate ( $\leq 125$  g), and crisps ( $\leq 50$  g).

Controlled interrupted time-series analyses were conducted of changes in purchases of common supermarket checkout foods in the 14 four-weekly periods before, and the 13 four-weekly periods after, implementation of checkout food policies – in units purchased per percentage market share. As different supermarket groups implemented policies at different times, separate analyses were conducted for each group. Supermarket groups that did not change their policies during the study period were used as comparators ( $n=2$ ). Results were synthesised using random-effects meta-analyses.

Data analyses were conducted in Stata/SE v14.2 and R v3.3.1.

**Results** In meta-analyses, implementation of supermarket checkout food policies was associated with a statistically significant decrease in purchases of common checkout foods of 1 37 160 units per percentage market share in the four weeks following policy implementation (95% confidence intervals (CI):  $-252,690$  to  $-21,630$ ). By 12 months this effect had diminished ( $-57,080$ ; 95% CI  $-167,760$  to  $53,590$ ).

**Conclusion** Implementation of supermarket checkout food policies was associated with an immediate reduction in purchases of sugary confectionery, chocolate and crisps that was not sustained at one year. Voluntary supermarket-led activities have the potential to decrease purchases of less healthy foods. Initial effects may be undermined over time by changes in behaviour of supermarkets, consumers, or both. The data are observational and exclude purchases not brought home.

OP41

#### NUTRITIONAL CONTENT OF HOUSEHOLD FOOD PURCHASES: STUDY OF TRENDS AND SOCIO-ECONOMIC INEQUALITIES IN BRITAIN 2012–2017

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**Background** Tackling the rise of non-communicable diseases has become a significant challenge for public health across the globe. Understanding diets and dietary behaviours is important due to significant links between poor diet and obesity, diabetes, cardio-vascular diseases and many cancers. This study aims to describe the patterns of expenditures on food and beverages purchased for at-home consumption in Great Britain and to examine socio-economic inequalities in the nutritional content of purchases.

**Methods** We use home-scan (Kantar Worldpanel) data covering daily purchases of all foods and beverages for at-home consumption in the period 2012–17 by  $\sim 32,000$  British households. The sample is nationally representative with respect to age and sex of the main shopper in the household, geographical region and socio-economic status. We estimate daily per capita purchases of energy, all sugars and saturated fats from 26 healthier and less healthy food groups defined using a nutrient profile model (UK Department of Health). Results are further stratified by social grade (A/B, C1/C2 and D/E).

**Results** Preliminary results show that daily per capita purchases of energy and sugar decreased between 2012 and 2017 from 2099 kcal (95% CI 2,091 to 2106 kcal) to 2002 kcal (95% CI 1,995 to 2009 kcal) and 116 g (95% CI 116 to 117 g) to 108 g (95% CI 108 to 109 g) respectively. Expenditure on saturated fat remained constant at 31 g (95% CI 31

to 32 g) per capita/day. Similar trends are observed across the three socio-economic groups.

We note a decline in energy purchased from meat and fish (8 kcal), bread and cereals (21 kcal), and fruits and vegetables (9 kcal), but an increase in the calories from dairy (7 kcal) and savoury snacks (9 kcal). There is a decrease in the energy and sugar purchased from less healthy non-alcoholic drinks, such that purchases of energy and sugar from healthier alternatives now exceed in comparison.

The nutritional content of sweet snacks expenditure has not changed (197 kcal and 18 g of sugar per capita/day). In contrast, the energy and sugar purchased from desserts and puddings decreased from 195 kcal (95% CI 194 to 196 kcal) to 166 kcal (95% CI 165 to 167 kcal), and from 20 g (95% CI 20 to 20 g) to 17 g (95% CI 16 to 17 g) respectively, accounting for 46% percent of the total decrease in sugar purchased daily.

**Conclusion** While small improvements in the nutritional content of food purchased for at-home consumption are detected, these may be offset by different trends in out-of-home purchases. To understand the extent to which these improvements influence social inequalities, further analyses focus on socio-economic differences in the nutritional content of purchases across all the food groups over time.

## Cardiovascular disease

### OP42 POTENTIAL IMPACTS OF BREXIT ON CARDIOVASCULAR DISEASE VIA CHANGES TO THE PRICE OF FRUITS AND VEGETABLES: A MODELLING ANALYSIS

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**Background** The UK's decision to exit the European Union will likely affect its current trade regimes. Trade policy can alter food commodity availability and price; it is thus a potentially powerful determinant of food environments and subsequently health. The UK is highly dependent on its fruit and vegetable (F&V) imports. Brexit could therefore affect F&V price and consumption in the UK. Given the strong association between F&V intake and cardiovascular disease (CVD), our analysis aimed to quantify the potential effects of F&V price changes due to Brexit on CVD in English adults between 2020–2030.

**Methods** We used the previously validated IMPACT Food Policy Model. The model combined publicly available data on F&V trade, published estimates of UK-specific price elasticities, F&V intake data from the National Diet and Nutrition Survey, and coronary heart disease (CHD) mortality projections for 2020–2030. We estimated the number of CHD deaths and life-years lost between 2020–2030 among English adults aged 25 years and above as a consequence of five Brexit scenarios: (1) Transitional Brexit; (2) post-Brexit Free Trading Agreement with the EU and maintaining half of the non-EU free trade partners; (3) post-Brexit Free Trading Agreement with the EU but no trade deal with any non-EU countries; (4) post-Brexit liberalised trade regime; (5) no deal Brexit. We then

performed Monte-Carlo simulations to better estimate uncertainty of inputs.

**Results** Under all Brexit scenarios, prices of F&V are likely to increase on average between 1.8% and 7.8%. The banana, citrus fruit, and tomato markets are likely to be the most disrupted, with price increases up to approximately 16.7%, 14.3%, and 13.4% respectively. A transitional Brexit is likely to result in approximately 670 (95% Uncertainty Interval: 430–980) extra CHD deaths and 6370 (4,360–8,990) life-years lost. A liberalised regime which eliminates all import tariffs is likely to contribute approximately 940 (600–1,370) additional CHD deaths and 8870 (6,060–12,540) life-years lost, due to non-tariff trade barriers between the UK and the EU. A no-deal Brexit scenario might be the most harmful, generating approximately 2900 (1,820–4,310) extra CHD deaths and 27 440 (18,200–39,630) life-years lost between 2020–2030.

**Conclusion** This analysis suggested that under all modelled scenarios Brexit is likely to increase the price of F&V and thus have a detrimental effect on the future diet and health of English adults. The UK government should therefore aim to secure a post-Brexit food system that incentivises the UK population to purchase and consume healthy foods.

### OP43 FINANCIAL STRAIN MODIFIES THE ASSOCIATION BETWEEN SYSTEMIC INFLAMMATION AND CARDIOVASCULAR MORTALITY

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**Background** Atherosclerosis and cardiovascular disease (CVD) have an inflammatory origin. Moreover, chronic psychosocial stress is associated both with inflammation and CVD. Our aim was to test whether the prognostic value for future CVD risk of a single inflammation test depends on the presence of chronic psychosocial stress.

**Methods** Data come from the nationally-representative English Longitudinal Study of Ageing. Psychosocial factors (financial strain, depression, social isolation, loneliness) and inflammatory markers (serum fibrinogen and C-reactive protein [CRP]) were collected in 4762 men and women, free of CVD and aged 52 to 101 y at baseline (2004–2005). Cox proportional hazards regression models were fitted to estimate the relationship (hazard ratios [HR] and 95% confidence intervals) between inflammatory marker and incident CVD death. Interactions terms between fibrinogen and each psychosocial factor were tested. Models were stratified by sex and adjusted for age, smoking, body mass index, physical activity, HDL/total cholesterol, triglycerides, hypertension and diabetes. Added predictive value over conventional CVD risk factors was assessed by change in C-statistics and reclassification.

**Results** There were 158 CVD deaths during a median follow-up of 8.1 y. The association between both inflammatory markers and CVD mortality was linear: HR 1 g/L of fibrinogen=1.46; 95% CI 1.20, 1.78 and HR log-unit CRP=1.35; 1.16, 1.57. Financial strain modified these associations. In the presence of financial strain (n=506, 24 deaths), the HRs for fibrinogen (3.32; 1.68, 6.57) and for CRP (2.15; 1.42, 3.26) were stronger than in the absence of financial strain (n=4256, 134 deaths) (HR fibrinogen 1.33; 1.07, 1.66 and HR CRP