Broken Plate 2021: the state of the nation's food system

Technical Report

Metric 1: Advertising

Data source/s: Nielsen Ad Intel, data kindly provided to the Food Foundation.

Nielsen measures advertising expenditure across all traditional media channels. Nielsen's advertising expenditure is used by advertisers and networks to shape the buying and selling of advertising. Digital advertising is monitored but due to the complexities of buying this medium Nielsen have decided not to include.

Analysis: Nielsen ran a report for use in Broken Plate for the calendar year 01 January 2020 to 31 December 2020 on Tuesday, 16 March 2021 at 13:12. This included seven different media channels (cinema, direct mail, door drops, outdoor, press, radio and TV) for two major product categories (food and drink) to include our four focus areas:

- Fruit and vegetables
- Confectionary
- Sweet and savoury snacks
- Soft drinks

We then calculated total advertising spend in sterling and percentage (%) spend per focus area, comparing 2020's data to 2017 and 2019 data (the years in which the previous two Broken Plate reports were published) for the same four groups of products.

There is a significant amount of volatility year on year in terms of where ad spend goes. As a result, each year some minor product categories drop off the list and new ones come in, with spend per product fluctuating a fair amount. We matched the final list of food and drink products used to calculate total spend in 2017 and 2019 as closely as possible to 2020's data for Broken Plate 2021 in order to track changes.

189 food and drink products were included in the final list of products for 2021's report. Water, six general food brand building/sponsorship categories, and baby food were excluded in addition to teas, coffees, sports/energy/health drinks and alcohol in line with those categories and products excluded for last year's data. This year, baby milk was also excluded, as it had not been included in the previous two datasets in 2017 and 2019 and cannot be strictly categorised as either a food or soft drink.

Although there was only a reduction of 5 products (3%) across our four focus areas between this year and last year's lists once non-relevant items had been excluded, the total amount spent on food and soft drink advertising was 15% less in 2020 than the amount spent in 2019.

Metric 2: Affordability of the Eatwell Guide

Data source: The Households Below Average Income (HBAI) dataset for 2018/19 is part of the Family Resources Survey (FRS). We used this in conjunction with Scarborough's 2016 paper modelling the cost per day of the Eatwell Guide (£5.99 per day) to calculate the percentage (after housing costs) of disposable income spent on the Eatwell Guide per income decile and per income quintile.

The FRS is an annual cross-sectional survey conducted on a representative sample of private households in the UK, capturing information on income of approximately 19,000 private UK households. Further details on the FRS survey design, sampling procedures and methods can be found elsewhere (Department for Work and Pensions, Family Resources Survey). From the FRS, the Department for Work and Pensions produces an analysis of the UK income distribution in its annual Households Below Average Income (HBAI) publication (Department for Work and Pensions, HBAI). Data from the 2018/2019 HBAI was used to calculate the average proportion of unequivalised household disposable income that would be used up by the estimated household Eatwell cost, by income decile. The HBAI datasets were obtained from the UK Data Service.

Methodology

Building on the Food Foundation's 2018 report, 'The Affordability of the Eatwell Guide', (Scott, 2018) and following on from Broken Plate 2019 and 2020, we adapted the methodology and STATA do file used previously to conduct updated analysis for FRS data 2018/19. Broken Plate 2019 used FRS data for 2016/17 and Broken Plate 2020 used 2017/18 data.

The Eatwell Guide splits the diet into a five-category pie chart: fruit and vegetables; potatoes, bread, rice, pasta and other starchy carbohydrates; beans, pulses, fish, eggs, meat and other proteins; dairy and alternatives; and oils and spreads. Each section of the pie chart is based on the proportion of the diet that should come from each category and was based on optimisation modelling commissioned by Public Health England and carried out at Oxford University (Scarborough et al., 2016). The optimisation modelling was used to identify a diet that achieved the UK food-based dietary guidelines whilst minimising changes from current consumption in the UK. The cost of such a diet was estimated to be £5.99 per adult per day, or £41.93 per week. The estimated cost of the Eatwell guide uses modelling undertaken in 2016, and so does not take into account any food price inflation in the intervening period.

This cost was calculated on a per portion basis (e.g. cost of a single portion of bread), rather than how much a person would need to spend to buy the foods in question (e.g. a loaf of bread), and therefore it is likely to underestimate how much a person would need spend to buy a full weekly diet based on the Eatwell Guide. The "price per portion" of each food was calculated using mean £ per kg of the food at a sub food group level (from supermarket data) and then converted from £ per kg as sold to £ per kg as consumed (because consumption data is recorded as weighted portions consumed) – therefore the price isn't exactly reflective of how much would be spent on the food basket. Subsequent research using a different method supports this assumption, as it found that the cost of a diet meeting 6-8 SACN dietary recommendations would be on average £6.54 per 2000 calories (Jones, Tong and Monsivais, 2018)

To better understand the affordability of healthy diets in the UK, we conducted a secondary analysis of the FRS, in which we consider our estimated cost of an 'Eatwell' diet in relation to UK household

disposable income. Weekly Eatwell cost per household was determined based on household composition. To consider different dietary intakes of children under 19 years, as well as economies of scale that would likely affect the overall Eatwell cost for a household, the McClement's equivalence scale was used to adjust the per-adult cost. Although a crude method, the McClement's scale was chosen over alternative equivalisation scales (e.g. OECD) because it better captures age group differences. This approach was also chosen over adjusting the adult cost based on recommended energy requirements (EAR) by age group/sex because it considers economies of scale with increasing numbers of household members, which an EAR approach would not.

Disposable income was defined as the amount of money available for spending and saving after direct taxes (such as income tax, national insurance and council tax) and after housing costs (AHC) are removed. It includes income from earnings and employment, private pensions and investments, and cash benefits provided by the state. Disposable income in the HBAI also includes the value of Free School Meals. Housing costs removed from disposable income included: rent; water rates, community water charges and council water charges; mortgage interest payments; structural insurance premiums; and ground rent and service charges.

Limitations and comments

The HBAI resets negative incomes before housing costs to zero but negative disposable incomes are still possible after housing costs are removed. The lowest income decile therefore includes some people who have very little or no income. It is made up of a diverse group of people, with some earning precarious incomes, some between jobs, and some living off savings. People who are homeless, sleeping rough or in institutional settings are not included in the Family Resources Survey.

While they may therefore not all be categorised as among the poorest 10% of households, it is not possible to further segregate this group by socioeconomic status. For those households in income decile 1 with a negative disposable income AHC it is therefore not possible to calculate the proportion of disposable income that would be used up by the Eatwell cost. These households were set to 100%, meaning that 100% of their disposable income would have to be spent on food. Income quintiles therefore provide a more balanced view of the percentage of disposable income poorer citizens would need to spend to afford the cost of the Eatwell Guide and are what have been reported in this year's Broken Plate.

Metric 3: The cost of more healthy/less healthy food

Data sources: The Office for National Statistics (ONS) Consumer Price Index (CPI) continuous dataset; National Diet and Nutrition Survey (NDNS) wave 1-3

The method and much of the data used to calculate the cost of more healthy vs. less healthy food are from The Centre for Diet and Activity Research (CEDAR) at the University of Cambridge, first used in this 2014 paper: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0109343 . This year we updated price data to 2021 and calculated the cost of food in each of the Eatwell Guide categories.

Methodology:

Food price

The CPI dataset provides monthly data on the price of a number of food and drinks products. Food and drink products are selected for inclusion in the CPI based on economic rationale and the list of items is updated each year to reflect the content of an average UK shopping basket. Health considerations are not taken into account. As a result, items drop in and out of the basket every year, and the basket does not necessarily reflect diets recommended in the Eatwell Guide. In order to track price trends over the course of a decade, only the 79 food and drink products that were consistently included in the CPI over 2010-2021 were included in this year's report. We calculated the median price for each quarter and used the mean of quarterly price data in each year for each item to calculate annual prices.

The CPI data for Quarter (Q) 2 of 2020 included a very high number of missing values due to food products being temporarily out of stock during the first wave of pandemic. The ONS record the price of these items as £0.00. Previously there were very few of these zero values and using the median monthly price per quarter meant that they had minimal impact on estimated costs. In Q2 of 2020, the number of £0.00 prices was so high that it substantially impacted calculated median, underestimating average prices. To provide comparable data across years, this year we removed Q2 from all included years. This had negligible impact on estimated prices in each year, but ensured that comparable data were presented for all years.

Food weights and nutritional content

We linked updated price data calculated as above to data calculated for the 2014 paper on average purchase weight and nutritional content.

Purchase weight was either as stated in the CPI (e.g. potatoes-new-per-kg); the weight of nearest match products from an online supermarket aggregator for items described in units (e.g. individual pizza); or weights provided in the USDA National Nutrient database (https://fdc.nal.usda.gov/) for loose items (e.g. single fruits).

Nutritional content per 100g was obtained from the UK Nutrient Databank. Some products in the CPI (e.g. tinned fruit) represent broader product groups than in the Nutrient Databank (e.g. tinned peaches, tinned pears). In these cases the mean nutritional content of all products within the group, weighted by consumption frequency from the National Diet & Nutrition Survey (NDNS) years 1-3, was calculated.

Food price data relates to food items as purchased (e.g. 100g of raw chicken breast) whereas nutritional data relates to food as consumed (e.g. 100g grilled chicken breast). To adjust for differences in weight and nutritional composition food yields were used from the US Department of Agriculture handbook 102: Food yields (https://babel.hathitrust.org/cgi/pt?id=uc1.b3614369&view=1up&seq=1).

Food categories

Nutritional content was used to categorise foods as either 'less healthy' or 'more healthy' using the FSA's nutrient profiling model (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216094/dh_123492.pdf).

Foods were also categorised into the groups in the EatWell Guide using the process described on p55 here: http://assets.wwf.org.uk/downloads/livewell_report_corrected.pdf

Analysis

Annual food prices, linked to nutritional content and food weights, were used to determine the cost per 1000kcal of foods identified as 'more healthy' or 'less healthy' and those in each of the EatWell Guide categories for each year from 2010-21.

Metric 4. Wages in the food sector

Data source:

The Office for National Statistic's Annual Survey of Hours and Earnings (ASHE) is carried out in April each year and is the most comprehensive source of information on the structure and distribution of earnings in the UK. ASHE provides information about the levels, distribution and make-up of earnings and paid hours worked for employees in all industries and occupations. The ASHE tables contain estimates of earnings for employees by sex and full-time or part-time status. Further breakdowns include by region, occupation, industry, age group and public or private sector.

The Resolution Foundation obtained ASHE data for the following dataset: Office for National Statistics. (2020). Annual Survey of Hours and Earnings, 1997-2020: Secure Access. 16th Edition. UK Data Service. SN: 6689. DOI: 10.5255/UKDA-SN-6689-16.

We looked at the annual data for the years 2012 through to 2020.

Methodology

The following filters and definitions were applied:

- GB only
- Low paid = paid less than 2/3 of overall median hourly pay
- Minimum wage or less = paid less than age-relevant minimum wage plus 1%.
- RLW = real living wage (the London or Rest of UK rates are applied, depending on location of worker)
- Covers employees only (i.e. not self-employed)

Relevant food industry sectors were then searched using the following codes:

- Industry groups (codes are all SIC 2007):
    - **Agriculture and fishing**: SIC code 1 (Agriculture, forestry & fishing) excluding 1.7 (Hunting).
    - **Food retail**: SIC codes 47.2 (Retail of food, beverages, and tobacco in specialised stores) excluding 47.26 (Retail of tobacco in specialised stores), plus 47.11 (Retail sale in non-specialised stores with food, beverages or tobacco predominating) and 47.81 (Retail sale via stalls and markets of food, beverages, and tobacco products).

    - **Food wholesale**: SIC codes 46.3 (Wholesale of food, beverages, and tobacco) excluding 46.35 (Wholesale of tobacco products), and 46.17 (Agents involves in the sale of food, beverages and tobacco).
    - **Catering (bars and kitchens)**: SIC code 56 (Food and beverage service activities).
- Occupation groups (codes are all SOC 2010):
    - **Kitchen staff**: SOC codes 5434 (Chefs), 5435 (Cooks), 9272 (Kitchen and catering assistants).
    - **Waiters & waitresses**: SOC code 9273.
- Whole food sector: any of the above.

Analysis:

We then looked at the absolute number and percentage of workers within each food industry sector earning the minimum wage, the RLW, or defined as low paid. We used the trend data provided to compare the change in the percentage of workers defined as low paid and paid at or below the minimum wage, and the percentage earning below the RLW, comparing 2012 data to 2019 and 2020.

Comments

A different secure process had to be used this year to obtain the data which means there may have been some slight differences in some of the cleaning and filtering processes used. Additionally, the ONS regularly revise and update their datasets. As a result this means that there are some slight discrepancies between the percentages reported in this year's Broken Plate for 2019's ASHE data and last year's report.

This year we followed the ONS's approach with these data, which is that **the numbers include furloughed workers.** This means it is quite hard to interpret the 2020 data; pay data are affected by some furloughed workers not having pay topped up, but also by a greater proportion of low paid workers losing their jobs and therefore dropping out of the dataset entirely. It is therefore difficult to confidently identify trends as we do not yet know which of those factors is dominating. For example, the low pay threshold is relative to the median, the median itself will have fallen due to compositional effects (i.e. which means the low pay threshold falls), whereas the minimum wage is a fixed number, so it's not affected in the same way.

As a result, while we have compared the data from 2020 to 2019's data, we have also included 2012 data to provide some context in terms of longer-term trends.

Metric 5. Places to buy food

Data source: Food environment assessment tool (Feat), UKCRC Centre for Diet and Activity Research (CEDAR) & MRC Epidemiology Unit, University of Cambridge

Analysis:

Feat provided data on proportion of fast-food outlets out of total food outlets for each local authority.

Feat is underpinned by data from Ordnance Survey's Points of Interest (POI) dataset. OS POI data for June 2020 contains information from over 170 suppliers and is one of the most complete sources of food outlet locations available in England. Data were extracted for the locations of cafes, convenience stores, restaurants, supermarkets, specialty and takeaway food ('fast-food') outlets (Ordnance survey, 2018b). POI classes 'fast food and takeaway outlets', 'fast food delivery services', 'fish and chip shops' and 'bakeries' were combined as takeaway food outlets. Takeaway food outlets as a proportion of all food outlets (%) within local authorities was then calculated. Local authority deprivation scores were from the Index of Multiple Deprivation 2015

Metric 6. Food products – sugar in cereals

Data source: Action on Salt and Action on Sugar

Analysis:

Due to the current COVID-19 pandemic and government restrictions, Action on Salt and Action on Sugar collected most of the data online via retailer websites, except for Aldi and Lidl which were collected in-store due to limited information available online. Data was collected between March and May 2021 and a total of 9 major online retailers were included: Aldi, ASDA, Lidl, Ocado (which covers Marks & Spencer's), Morrisons, Sainsbury's, Tesco, The Co-operative and Waitrose. Data for all children's yogurts and cereal products which appeared to meet the inclusion criteria and was available in store according to the retailers' websites was obtained online and inputted onto an Excel spreadsheet. In the case of Aldi and Lidl, yogurts and breakfast cereals which met the inclusion criteria were purchased and nutrition data inputted onto the Excel spreadsheet. The collected data then underwent rigorous inclusion and exclusion criteria for what would be deemed 'child friendly packaging' based on previous Action on Sugar and Action on Salt surveys and other literature.

Cereals

Inclusion:

A. Child friendly imagery (such as cartoon characters)
B. Child friendly style (such as bright colours, animated)
C. Child friendly brand character (such as Tony the Tiger)
D. Child friendly font (such as balloon letters and child friendly fronts)
E. Child friendly media partnerships (such as Disney)
F. Child friendly offers (such as a free game)
G. Child themed language (such as 'made for kids')
H. Child friendly activities (such as wordsearches on the back of pack)

Exclusion:

A. Animations that are part of company logos
B. Non child-themed lifelike drawings (such as pencil like drawings or sketches)
C. Duplicates of the same product, but in different packaging sizes

Yogurts

Inclusion:

A. Chilled yogurts with more than 50% dairy or dairy alternative, as defined by retailer's categorisation on their website
B. Small and medium sized yogurt pots that are aimed for children
C. Child friendly imagery (such as cartoon characters)
D. Child friendly style (such as bright colours, animated)
E. Child friendly brand character (such as Peppa Pig)
F. Child friendly font (such as balloon letters and child friendly fronts)
G. Child friendly media partnerships (such as Disney)
H. Child friendly offers (such as a free game)
I. Child themed language (such as 'made for kids')

Exclusion:

A. Drinking yogurt
B. Ambient yogurt with less than 50% dairy or dairy alternative
C. Animations that are part of company logos
D. Non-dairy puddings e.g. chocolate mousse

Inclusion and Exclusion Criteria

Out of 515 cereals available in retail, 126 products met the inclusion criteria and were assessed against the Government's Front of Pack nutrition labelling guidance to note how many products were high, medium, or low in sugar, salt, and saturated fat. In addition to this, a scoring system was created for fibre based on previous reports.

Out of 153 yogurt products, 100 met the inclusion criteria. Products were analysed through the Government's Front of Pack nutrition labelling guidance to indicate how many products were high (red), medium (amber) or low (green) for sugar, fat and saturated fat (see Table below). Where possible, comparisons were made with yogurts collected in 2016 (data obtained from previous literature on 101 children's yogurts). A direct comparison was made on 33 yogurts, which were matched and tracked over time. Total sugars was reported on throughout the report. A proportion of sugars present in yogurts will be naturally occurring within milk and dairy products (lactose), however current nutrition labelling displays 'total sugars' only, and does not differentiate between these, and free sugars.

	Low	Medium	High
Saturated fat	≤1.5g/100g	>1.5g to ≤5.0g/100g	>5.0g/100g
(Total) Sugars	≤5.0/100g	>5.0g to ≤22.5g/100g	>22.5g/100g
Salt	≤0.3g/100g	>0.3g to ≤1.5g/100g	>1.5g/100g
Fibre	<5g/100g	≥5g to <10g/100g	≥10g/100g

Nutrition labelling criteria for 100g of food

Comparison to previous years:

This 2021 report includes 126 cereals that meet the inclusion criteria, compared to 120 products with similar inclusion criteria in the 2020 report and 77 in 2019. Every effort was made to collect comprehensive data for direct comparisons over the years. Out of the 126 cereals included in this study, 101 were matched to cereals included in the 2020 report.

Out of the 100 yogurts surveyed this year, 33 were matched with data obtained in 2016 from previous literature[4] and assessed for direct comparison. A <5% margin of error has been applied to account for changes in analysis methodology.

A note on retailers removing cartoon characters in breakfast cereals:

Recent commitments made by companies to remove cartoon characters from their packaging have meant that several brands of cereal were not included in this year's report. This includes Nestle's *Shreddies* range, *Shredded Wheat Bitesize* and *Multigrain Cheerios*. Lidl, Aldi, and Tesco have also rebranded some of their own-brand cereals to have simpler packaging.

This year we have identified several cereals with improved, plainer packaging. But despite the removal of cartoons from some retailers and manufacturers, packaging has still been designed with animated text, backgrounds, and similarly attractive designs, which makes them stand out from other cereals plainer packaging. For the purpose of this report, cereals with such packaging were still included in the analysis.

Metric 7. Food products – veg in ready meals

Data source: Eating Better's *Ready Meal's Snapshot Survey 2021 Report*. Forthcoming.

Methodology

Eating Better's 2021 survey includes 2,318 ready meals available to buy in 10 major UK supermarkets in March 2021. As for their 2020 report Eating Better worked with foodDB on this survey, a comprehensive, real-time database of food and drink products available online in the UK, developed at the Nuffield Department of Population Health, University of Oxford. With a focus on products available to buy online in all major UK supermarkets, foodDB currently collects information on over 120,000 food and drink products every week. It uses big data techniques for collection, processing, storage and analysis of available products, making it a powerful tool to track and evaluate changes in the marketplace (Harrington et al, 2019).

This year's snapshot survey looks at ready meals available to buy online in Tesco, Morrisons, Asda, Waitrose, Ocado, Co-Op, Iceland, Sainsbury's, Aldi and M&S in March 2021.

Analysis

We included products available from the ready meal section of supermarkets, including both own-brand and branded meals, chilled and frozen options. We included both 'ready meals' and 'ready to cook foods', products designed to require no further preparation beyond opening the package and heating or cooking according to the on-pack instructions. We only included main meals designed to be eaten hot. We used a broad definition of 'main' to include products that would feasibly either comprise a meal or else the main part of a meal.

We excluded products classified as side dishes or snacks on the packaging or online shop. Where one supermarket classed a meal as a side or snack, e.g. a single bao bun, we excluded equivalent products available in other supermarkets. We also excluded non-ready meals sometimes available in the 'ready meals' section of supermarkets, including pizzas, soups, cold salads, burger patties and sausages.

The 2021 survey analyses 2,743 ready-meals. Where the same branded products were found in different retailers, we included all of them in total products for each retailer. When analysing the total data set from all retailers, branded products were only included once, yielding a sample of 2,318 meals.

The ingredients text for each product was used to classify it into one of four categories: 'meat', 'fish', 'vegetarian', or 'plant-based'. Vegetarian products may contain eggs or dairy products, but no meat, fish or seafood. Eating Better and foodDB defined plant-based products as those either labelled as suitable for vegans or which did not appear to contain animal products on the label. Ingredient lists were also used to identify core ingredients, including type of meat (beef, lamb, pork, chicken, turkey, duck) and cheese. Where a dish contained several types of meat, it was classified according to the one used in greatest quantity (listed first). Meal prices (per portion) and special offers were also recorded. Meal prices and special offers were recorded and analysed to obtain price per portion. Price per portion analysis excludes ready meals aimed at children.

Comments

Please note that the surveys are cross-sectional designs, providing an accurate picture of a specific moment in time, and are thus useful for showing big changes or trends but are not as useful for highlighting any small variations.

In previous surveys, Eating Better conducted fieldwork in store to supplement online data. Due to COVID restrictions this was not possible in 2021, so this year's sample excludes Lidl, where online data were not available.

Figures for Ocado include all ready meals (own-brand and branded) available to buy at the supermarket at the time of the survey. In September 2020, Ocado stopped selling Waitrose groceries and launched a delivery partnership with M&S. Therefore, our 2020 Ocado survey figures include Waitrose and Ocado own-brand meals, whilst our 2021 Ocado figures include M&S and Ocado own-brand meals.

M&S groceries are currently available to buy online only through Ocado. Our 2021 M&S sample includes only M&S own-brand ready meals available to buy at Ocado.

Metric 8. Children with obesity

Data sources:

England: National Child Measurement Programme 2019/20. Age group – Reception (4-5-year-olds).

Scotland: Child Health Surveillance Programme 2019/20. Age group – Primary 1 (4.5-6.5-year-olds).

Wales: Child Measurement Programme 2018/19. Age group – 4-5-year-olds.

Analysis:

The Child Measurement Programmes in all three nations are annual surveillance programmes that measures the height and weight of children.

Deprivation was measured by

- England: 2015 Income Deprivation Affecting Children Index (IDACI) which measures the proportion of children under the age of 16 living in low-income households.
- Scotland: Scottish Index of Multiple Deprivation (SIMD)
- Wales: Welsh Index of Multiple Deprivation (WIMD)

Deprivation group in all cases compares top and bottom quintiles of deprivation.

These data use the standard definitions of overweight and obesity that are reported by each of the 3 nations. We used the UK90 reference charts, defining overweight and obesity at the 85th and 95th centile cut-offs.

For Northern Ireland, this uses international definitions of overweight and obesity rather than the definitions used by the other three nations in the UK. We therefore didn't include Northern Ireland this year, as it is not comparable to the other countries.

Metric 9. Child growth

Average height of White British children

Data source: National Child Measurement Programme; Analysis by PHE

Analysis:

The data presented is for Year 6 children in England only. The National Child Measurement Programme (NCMP) is an annual surveillance programme that measures the height and weight of children attending state-maintained primary schools in England. This data were analysed by Public Health England.

They show average height in centimetres for children aged 10 to 11 years measured in the NCMP in the academic year 2019-2020 by deprivation decile and sex, for White British Children

Deprivation was measured using the 2019 Income Deprivation Affecting Children Index (IDACI) which measures the proportion of children under the age of 16 living in low-income households. Deprivation groups have been shown as deciles.

Ethnicity was grouped into White British, Asian, Black and Other Ethnicity as follows:

NHS Ethnicity Code	Ethnicity description	Ethnic grouping in data tables
A	White - British	White
B	White - Irish	White
C	Any Other White Background	White
D	White and Black Caribbean	Black
E	White and Black African	Black
F	White and Asian	Asian
G	Any Other Mixed Background	Other
H	Indian	Asian
J	Pakistani	Asian
K	Bangladeshi	Asian
L	Any Other Asian Background	Asian
M	Black - Caribbean	Black
N	Black - African	Black
P	Any Other Black Background	Black
R	Chinese	Other
S	Any Other Ethnic Group	Other
Z	Not stated / Invalid	Other

Limitations*:*

School closures in March 2020, due to the COVID-19 pandemic, meant that in 2019 to 2020 the number of children measured was around 75% of previous years. The 2019 to 2020 NCMP data only include children measured between September 2019 and March 2020, therefore the data on average height in centimetres are not comparable with previous full measurement years. As children are taller towards the end of the school year, the 2019 to 2020 data shows a lower average height (centimetres) compared to the previous year's data, however, the data continues to show the same pattern by deprivation decile.

International comparison

Source: Height and body-mass index trajectories of school-aged children and adolescents from 1985 to 2019 in 200 countries and territories: a pooled analysis of 2181 population-based studies with 65 million participants - NCD Risk Factor Collaboration (NCD-RisC), 2020.

Analysis: This data is from a recent Lancet report that pooled studies from 200 countries to explore the high variability in height of school-aged children. The study grouped together high income countries in the Global North within the category 'high income western countries'.

Limitations: There are several factors that may be limitations on direct comparison between countries on the influence of nutrition on growth. Further details of these are outlined in the Lancet report but include genetic variation, intergenerational differences and exposures during pregnancy.

Metric 10. Diabetes and amputations

Data source: Diabetes Footcare Profiles, National Diabetes Audit

Analysis:

This profile presents information on people with diabetes from England, who were admitted to hospital for foot disease. The information in the profile is compiled from Hospital Episode Statistics (HES).

Data are provided for adults in England for number of major and minor amputations over three-year periods. A major lower-limb amputation refers to above the ankle. We took an average to work out the average per year over that three-year period.

The total population in England grew 6% in the period 2011-2019, so some of the 24% increase in amputations may be due to population growth. There may also have been changes in age profile, racial profile and health policy that might account for the increases.

Data on registrations is from the National Diabetes Audit in England 2015-2016 to 2020-2021. Data is for Type 2 and other diabetes (excluding Type 1). Quintile of deprivation is based on the Index of Multiple Deprivation.

Limitations: These data include Type 1 and Type 2 diabetes. We were not able to obtain publicly available and disaggregated data for Type 1 and Type 2 diabetes.

The Current and Future Health of Children Born in 2021

The following data sources were used to model projections for the prevalence of nutrition-related chronic diseases per 100 children for 2021's birth cohort. We estimated the projected data based on trends for several years. The most recent reports in the time trend series used for the various health outcomes spotlighted have been cited below.

Mortality rates

Marshall L, David Finch D, Cairncross E, Bibby J. Mortality and life expectancy trends in the UK: Stalling progress. Health Foundation 2019 (Projection for cohort born 2005).

Life expectancy

Office for National Statistics 2021, Health state life expectancies by Index of Multiple Deprivation (IMD 2015 and IMD 2019): England (age 65-69)

Obesity and overweight

Child Overweight and Obesity: National Child Measurement Programme, England 2019/2020. Index of Multiple Deprivation (IMD) decile based on the postcode of the child.

Adult Overweight and Obesity: Health Survey for England 2019 (age 16-24 and average of age groups 55-64 and 65-74)

Diabetes

Prevalence: Health Survey for England 2019, Adults Health (average of age groups 45-64 and 65+)

Cardiovascular disease (CVD)

CVD prevalence: British Heart Foundation, Heart and Circulatory Disease Statistics 2019 (average of age groups 55-64 and 65-74)

Cancer

J Maddams et al, Projections of cancer prevalence in the UK. Brit J Cancer. 2012; 107:1195-1202 (age >65)

Osteoporosis

Rates of admission for fractures of the femur: Balasegaram S, Majeed A, Fitz-Clarence H. Trends in hospital admissions for fractures of the hip and femur in England, 1989-1990 to 1997-1998. J Public Health Med. 2001 Mar;23(1):11-7 (average of men and women age groups 45-64 and 65-74)

Osteoporosis prevalence figures: Hernlund E et al. Osteoporosis in the European Union: medical management, epidemiology and economic burde : A report prepared in collaboration with the International Osteoporosis Foundation (IOF) and the European Federation of Pharmaceutical Industry Associations (EFPIA). Arch Osteoporosis. 2013;8:136.

Dental decay

Adult tooth decay: Adult Dental Health Survey 2009 theme 2 (average of age groups 55-64 and 65-74). Trend data unreliable.

Tooth loss: Figures from Broken Plate 2020 used.

Micronutrients and Macronutrients

Public Health England 2020, National Diet and Nutrition Survey: results from years 9 to 11 (combined) - data tables.

Analysis:

We used published forecasts where these are given in the published literature cited here. Where they were not available for the age group and year needed, we used the Excel 'Forecast' function to make projections from the available published data.

We were not able to incorporate differential outcomes for different socio-economic groups for all nutrition-related chronic diseases of interest, given that it is very difficult to predict what these will look like in the future. However, it is very likely that outcomes will be worse the poorer you are. Where it was possible to include projections for different socio-economic groups (broken down by Index of Multiple Deprivation (IMD) decile), the forecasts assumed no change in IMD group during the relevant time period.

Note that the trajectory was *not* included in 2019's Broken Plate report but was published later as part of the Food Foundation's response to the Department of Health and Social Care's Green Paper *Advancing our health: prevention in the 2020s,* outlining the government's planned approach for prevention of the major preventable health problems facing people in the UK. https://foodfoundation.org.uk/the-prevention-green-paper-response-we-need-much-more-much-faster/. This will be the second year it forms part of Broken Plate.

Comments

Diet-related diseases will occur both among those with high BMI and those at a lower BMI. Cancer has been included as a diet-related disease, with around a third all cancer cases estimated to be preventable through healthy lifestyles (WCRF, 2018).

Note that the projected figures based on trends indicate overweight prevalence staying the same or reducing while obesity increases, and especially morbid obesity. This is probably a consequence of the mean BMI moving up through the 'overweight' category towards the threshold for obesity.