

# **Food Insecurity and Public Health**

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# Food Security – Definitions

In order to measure anything, a clear definition is needed.

How do we define food security? How does it relate to nutrition security?

Hot Springs Conference 1943 – 44 governments met in Hot Springs, Virginia USA to consider goal of freedom from want regarding food & agriculture. Concluded:

- **“freedom from want”** meant a secure, adequate and suitable supply of food for every man, woman and child
- **“secure”** referred to the accessibility of the food
- **“adequate”** referred to the quantitative sufficiency of the food supply and
- **“suitable”** referred to the nutrient content of the food supply.

<http://www.fao.org/3/MD776E/MD776E.pdf>



# Food Security vs. Nutrition Security

## Food Security

**FAO World Food Summit 1996**

“Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.

## Nutrition Security

**FAO/AGN, March 2012**

“Nutrition security exists when all people at all times consume food of sufficient quantity and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, adequate health, education and care.”



# What do we actually measure?

- **USA Definition of Food Security (USDA)**

- **High food security:** no reported indications of food-access problems or limitations.

- **Marginal food security:** one or two reported indications—typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of changes in diets or food intake.

- **Low food security:** reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake.

- **Very low food security:** reports of multiple indications of disrupted eating patterns and reduced food intake.

(<https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx>)



# Does this measure hunger?

**Hunger** = "the uneasy or painful sensation caused by lack of food."

*What does this mean? Different for everyone? Can we measure it?*

**Short answer is no – we do not measure hunger.**

The US is currently reviewing a separate measure for hunger, but for now measurement of food insecurity provides "some information about the economic and social contexts that may lead to hunger but does not assess the extent to which hunger actually ensues."

<https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/measurement.aspx>



Does this measure nutritional quality?



**UK definition?** No unique UK definition for food security or insecurity.

**Current situation:**

”Due to the lack of standardization and comprehensive measurement of food insecurity, it is difficult to definitively state the prevalence. However, it is clear that food insecurity rates are too high, and despite being the fifth richest economy in the world, the UK has some of the worst rates of food insecurity in Europe.” (HOL 2020, p. 37)

**NEW - Family Resources Survey (FRS)**

- Measure of household incomes and living standards nationally UK added a measure of food insecurity in 2019.
- Nationally representative sample for UK (4 nations) – annual survey.
- *Data expected to be available 2021.*



# What do we know?

**FAO** – In 2018 estimated around 2.2 million people in the UK were severely food insecure (i.e. with limited access to food, due to a lack of money or other resources).

(Food and Agriculture Organization of the United Nations, The State of Food Insecurity and Nutrition in the World, Building Climate Resilience for Food Security and Nutrition (2018), p 138: <http://www.fao.org/3/I9553En/i9553en.pdf> [accessed 29 June 2020])

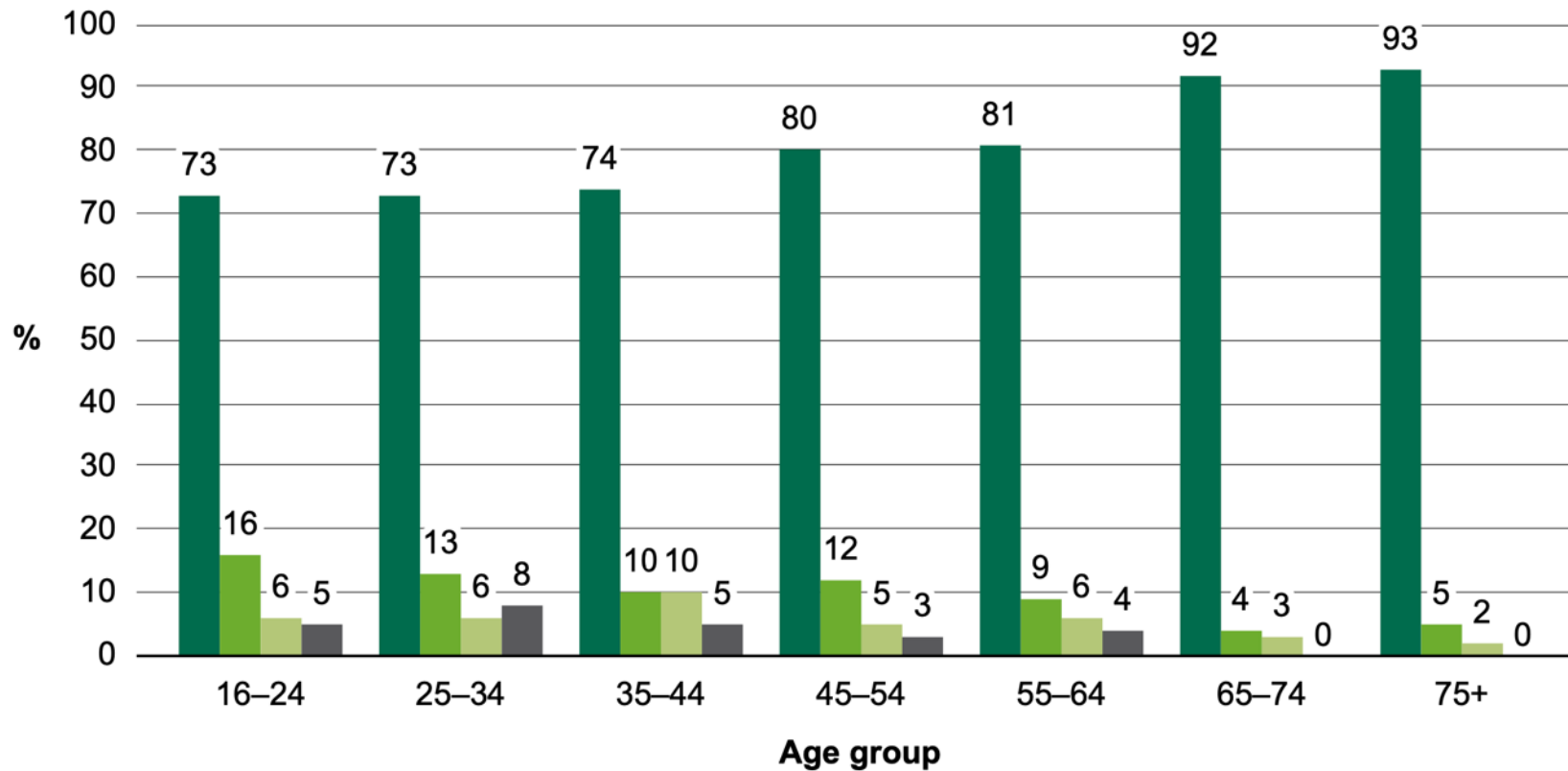
## **Food and You Survey (England, Wales & Northern Ireland)**

- In Food and You, household food security is measured using responses to ten different questions relating to experiences with accessing and consuming food.
- Respondents are allocated a score based on these responses. Households that report three or more conditions indicating food insecurity are classified as ‘food insecure’.





Figure 1.8. Food security status by age group (Wave 5)



- High food security
- Marginal food security
- Low food security
- Very low food security

# Food & You Survey Data – 2018

- **80% of respondents lived in households with high food security**
- **10% in households classified as marginally food secure**
- **10% reported living in household with low or very low food security.**

[https://www.food.gov.uk/sites/default/files/media/document/food-and-you-wave5-combined-report-web-version\\_1.pdf](https://www.food.gov.uk/sites/default/files/media/document/food-and-you-wave5-combined-report-web-version_1.pdf)



# Food bank recipients – pre-Covid-19

- Children are disproportionate recipients of charity food (Garrett 2017).
- Foodbank usage has risen alongside cuts to social security benefit (Loopstra et al., 2015).
- Individuals and households impacted by recent welfare reforms are more likely to receive food bank parcels (MacLeod et al. 2019).
- In-work poverty, disability, and unemployment rates all associated with foodbank use (Loopstra et al. 2019).

**A majority of food insecure households do not use foodbanks (MacLeod et al. 2019) – in part due to embarrassment (Purdam et al., 2016), or a reluctance to accept charity (Purdam et al., 2019).**



# Other data – UK Foodbanks

## Trussell Trust

- Operate over 1,200 foodbank centres across the UK
- Between 1st April 2018 and 31st March 2019, food banks in The Trussell Trust's network provided 1,583,668 emergency supplies to people in crisis. 577,618 of these supplies went to children
- A 19% year-on-year increase
- Main reasons for referral between April 2018 – March 2019:
  - 33.1% due to low income – 80% for people receiving benefits
  - 20.3% due to delays in benefits being paid
  - 17.3% due to changes in benefits

<https://www.trusselltrust.org/2019/04/25/record-1-6m-food-bank-parcels/>

## Independent Food Banks

- 859 independent foodbanks
- Evidence on their scale of operations is only just emerging, and little is known about their recipients
- Recent Scottish evidence suggests that independent foodbanks distribute a similar number of food supplies as the Trussell Trust

Loopstra et al. 2019 - [https://uploads.strikinglycdn.com/files/0681ad7a-2d07-489f-9c11-77dc3d1aa968/Report\\_IndependentFoodBankStudy\\_Dec2019-pdf.pdf](https://uploads.strikinglycdn.com/files/0681ad7a-2d07-489f-9c11-77dc3d1aa968/Report_IndependentFoodBankStudy_Dec2019-pdf.pdf)

<https://menuforchange.org.uk/wp-content/uploads/2019/03/Emergency-Food-Parcel-Provision-in-Scotland-Apr-2017-to-Sep-2018.pdf>



# State of Hunger Report – Trussell Trust 2019

94% OF PEOPLE  
REFERRED TO  
FOOD BANKS  
ARE DESTITUTE.



STATE OF  
**HUNGER**



## People referred to food banks:

- **Average income approximately 11% of national median household income.** Poverty threshold is 60% of median income.
- **23% were homeless; 9% were in emergency accommodation, 7% in temporary accommodation, 5% staying at a family or friends' house and 2% were rough sleeping.**
- Those with housing costs – many had costs close to total income within previous month.
- Areas of high housing pressure had substantially more take-up of food parcels

## Health issues – nearly 75% reported health issues affecting someone in the household

- More than half reported mental health condition
- A quarter were affected by a long-term physical condition or illness
- 1 in 6 in six reported a physical disability.
- 10% had a learning disability





HOUSE OF LORDS

Select Committee on Food, Poverty,  
Health and the Environment

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Report of Session 2019–20

# **Hungry for change: fixing the failures in food**

## **Food Insecurity in the UK**

**2019-2020  
HOL Report – July 2020**

**Wide reaching report on  
many aspects of the current  
food system and its impacts  
on the population.**

<https://publications.parliament.uk/pa/ld5801/ldselect/ldfphe/85/85.pdf>



# COVID-19 EFFECT

- **Many more individuals and households have become reliant on food banks and wider community support.**
- **The Trussell Trust reported an 81% increase in emergency food parcels during the last two weeks of March 2020 compared to the same period in 2019 including a 122% rise in parcels for children.**
- **Polling data shows estimated 4.9 million people in the UK, including 1.7 million children (12% of all UK children) experienced food insecurity in May 2020, a 250% increase over pre-Covid-19 levels.**
- **150% higher risk of food insecurity found:**
  - **in households headed by a black, Asian or minority ethnic (BAME) adult or**
  - **with children eligible for free school meals, individuals with disabilities, and**
  - **households who were self-isolating.**



# Food Insecurity & Health Impacts across the life course – Rapid Evidence Review

A rapid scoping review was undertaken to identify areas of interest regarding impact of food insecurity on health and wellbeing outcomes across all areas of the life course. This identified the following main areas of interest:

- Mental health – depression, anxiety, stress, suicide ideation
- Physical health – weight, daily activities in older people, variety of negative health outcomes
- Development – academic, social and emotional development in children
- Health care costs – healthcare utilization levels, total costs, hospital admissions



# Public Health Impacts of Food Insecurity

Children and Young People – Increased risk of behavioural, academic and emotional problems; increased aggression and anxiety levels; increased suicidal ideation; a transient impact on toddler development (associated with parental food insecurity); and weight gain in childhood (American Academy of Pediatrics 2015; Gunderson and Ziliak 2015 ; Hernandez and Jacknowitz 2009; Jyoti et al. 2015; Shankar et al 2017)

Working-age adults – Increased risk for a range of chronic diseases, including diabetes, hypertension, hyperlipidemia, NFALD, CVD, obesity levels; poor sleep outcomes; depression. (Petrovic et al 2018; Golovaty et al 2020; Gunderson and Ziliak 2015; Wang et al. 2015; Yau et al. 2020)

Older adults – Limitations to activities involved in daily living; depression and anxiety (Gunderson and Ziliak 2015)

Whole population – Increased risk of social and mental health; increased health care costs in infancy and adulthood (de Cuba et al. 2018; Dowler et al. 2011; Tarasuk et al. 2015)





# Systematic Reviews (n=11)

Topic area	Papers	Summary of Key Findings
CYP - Quality of life & development	4	Food insecurity linked to reduced quality of life, poor early childhood development, behavioural academic and emotional problems, ADHD symptoms
CYP - Undernutrition	1	No risk between HFI and stunting found in high-income countries
Mental Health	1	Food insecurity positively associated with depression and stress, but not anxiety.
Dietary Quality	3	Food bank users consume diets that don't meet nutritional recommendations for fruit and vegetable and dairy consumption; some micronutrient levels are below recommendations, but not all.
Weight in adults	1	Adults in food insecure houses, especially women are at higher risk of obesity. Risk increases with level of severity of food insecurity.

## Limitations:

- Not UK populations – transferable?
- Different tools used to assess food insecurity, may not measure the same things
- Self-reported data – perception of food insecurity, cannot discount unknown bias



# Children & Young People and Food Insecurity

Topic area	Papers	Key Findings
Quality of life, development & achievement	4	<ul style="list-style-type: none"> <li data-bbox="792 249 2369 349">• Dose-response relationship between diet quality and health-related Quality of Life in children and adolescents (Wu et al., 2020)</li> <li data-bbox="792 421 2369 578">• Household food insecurity associated with poor early childhood development, specifically in high-income countries associated with developmental risk, poor math and vocabulary skills (de Olivera et al., 2019)</li> <li data-bbox="792 649 2369 806">• Across developed countries, even marginal levels of household food insecurity associated with behavioural, academic and emotional problems in children, beginning as early as infancy (Shankar et al., 2017)</li> <li data-bbox="792 878 2369 1035">• Substantial evidence supports link between childhood food insecurity and attention deficit hyperactivity disorder (ADHD), with impacts on pediatric ADHD symptoms and possible lasting effects into adulthood (Lu et al., 2019)</li> </ul>
Undernutrition	1	<ul style="list-style-type: none"> <li data-bbox="792 1066 2407 1335">• Review of 16 observational studies from both HIC and LMIC identified association between household food insecurity (HFI) and stunting and being underweight in children and adolescents; of these, 5 studies conducted in HIC (USA 4, Canada 1) did not identify risk between HFI and stunting (4 found no risk, 1 found risk associated with moderate food insecurity) (Moradi et al., 2019)</li> </ul>

## American Academy of Pediatrics, 2015

- Lack of adequate food linked with increased risk of behavioural, academic and emotional problems from preschool through adolescence.
- **Children of all ages living with food insecurity are at risk of lower cognitive indicators, dysregulated behaviour and emotional distress.**

## Jyoti et al. 2005 (USA)

- Prospective **cohort** data (n ~21,000) followed children from Kindergarten (age 5) through 3<sup>rd</sup> grade (4 years, ages approximately 5 – 8)
- Assessed FI, weight, height, academic performance and social skills with aid of teachers.
- Analysis controlled for multiple child and household contextual variables (demographic and socioeconomic variables)
- Authors conclude **household food insecurity at kindergarten predicted impaired academic performance in math for all children, a greater decline in social skills for boys, and greater weight and BMI for girls.**

## Ad-hoc search results regarding FI and CYP

*“The inability to consistently provide food creates stress in families contributing to depression, anxiety and toxic stress, which make optimal parenting difficult regardless of social class.”*

(AAP, 2015. p.e1432)



# Mental Health and Food Insecurity

Topic area	Papers	Key Findings
Mental health	1	<ul style="list-style-type: none"><li>• 19 studies included (n&gt;372,000) within 10 countries</li><li>• <b>Positive relationship between food insecurity and depression (OR = 1.40, 95% CI 1.30, 1.58) and stress (OR = 1.34, 95% CI 1.24, 1.44)</b></li><li>• No relationship found between food insecurity and anxiety</li><li>• Sub-analysis showed <b>increased association with food insecurity and risk of depression in older people (age 65+) compared with younger groups, and in men compared with women</b></li><li>• Geographic sub—analysis showed highest risk of stress and anxiety associated with food insecurity within North America compared with other regions</li></ul> <p><i>(Pourmotabbed et al., 2020)</i></p>



# Obesity and Food Insecurity

Topic area	Papers	Key Findings
<b>Food insecurity and adult weight abnormality</b>	<b>1</b>	<ul style="list-style-type: none"><li>• Systematic review and meta-analysis</li><li>• 31 Studies included – 14 different countries (n=115,993)</li><li>• Meta-analysis showed adults in <b>food insecure households have increased risk of obesity (OR 1.15, 95% CI 1.06 – 1.23)</b></li><li>• Sub-group analysis by sex – women have higher risk compared with men (OR 1.26, 95% CI 1.05 – 1.46)</li><li>• <b>Risks of weight abnormality increased with the intensification of the level of food insecurity.</b><ul style="list-style-type: none"><li>• <b>Severe food insecurity (OR 1.29, 95% CI 1.09 – 1.57)</b></li><li>• Moderate and mild food insecurity not significantly associated with increased levels of obesity.</li></ul></li><li>• Sub-analysis demonstrated <b>food-insecure households (any level) living in developed countries had significant risk of obesity (OR 1.14, 95% CI 1.05 – 1.23)</b>, but not overweight or underweight.</li></ul> <p><b>(Moradi et al, 2019)</b></p>



# Food Insecurity and Obesity

Some evidence to suggest there is an independent link between food insecurity levels and obesity. Evidence strongest for adult women, mixed in terms of children; men don't seem to be at risk of obesity from food insecurity (Morales and Berkowitz 2016)

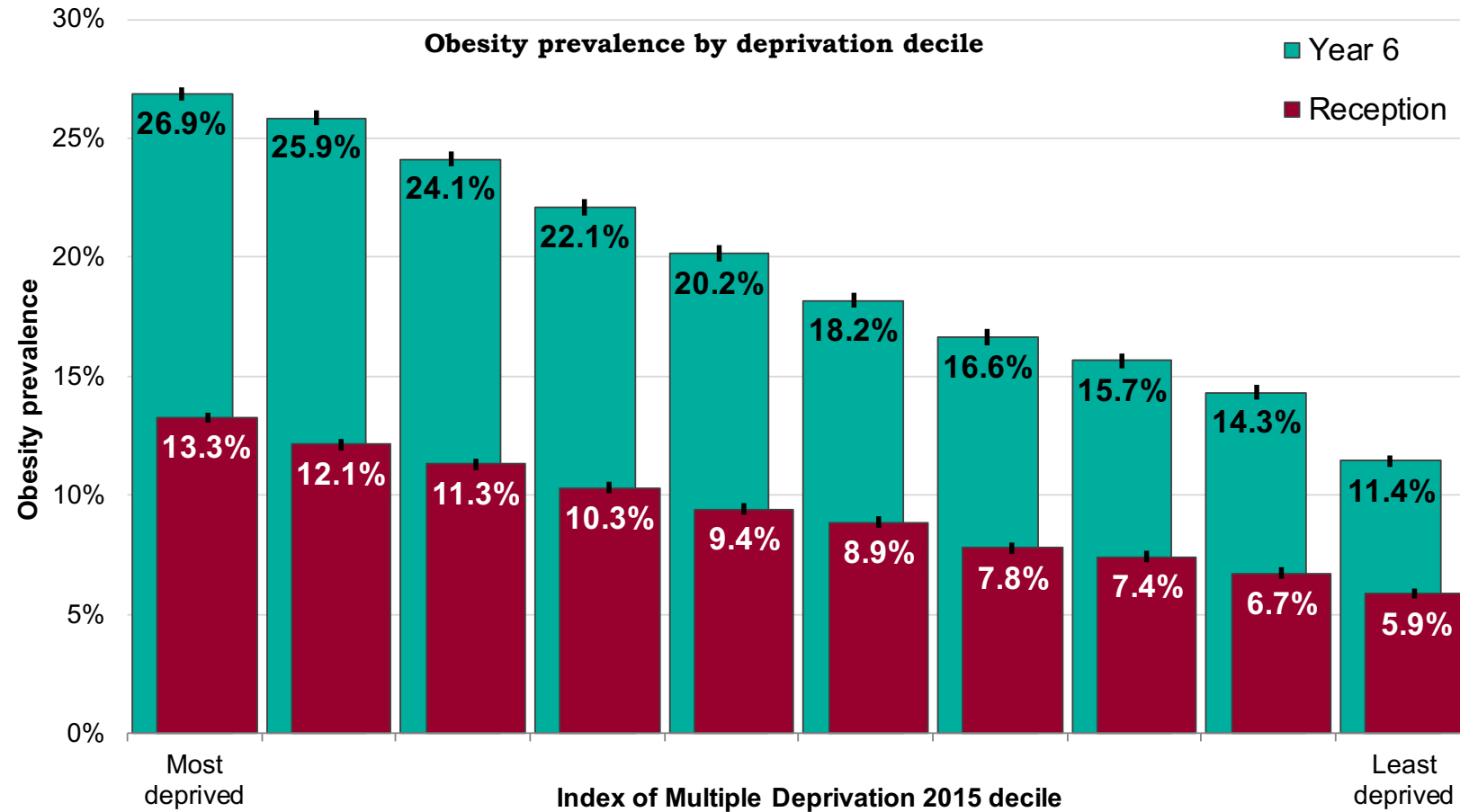
Some studies with interesting findings that may add to the discussion:

- A 2019 US study found among **bariatric surgery patients, close to 18% were food insecure and an additional 27.6% were marginally food insecure.** (Price et al 2019)
- **Food insecurity is associated with maladaptive eating behaviours and overeating;** authors concluded it may amplify susceptibility to weight gain via overeating during times of unlimited food access (Stinson et al. 2018)
- **Food insecurity experienced in adolescence for girls may be an independent risk factor for unhealthy weight control behaviors** (Hooper et al 2020)



# Obesity and deprivation

National Child Measurement Programme 2018/19



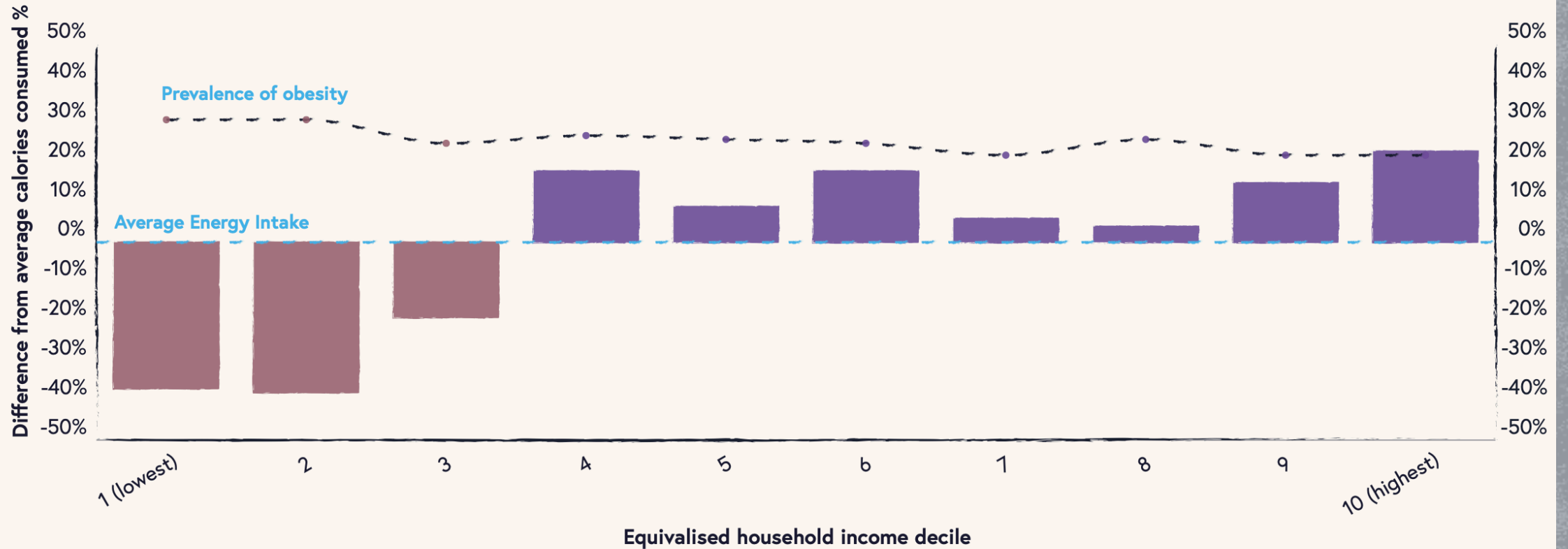
## Obesity is a disease of poverty

- One of the biggest public health challenges facing the UK
- Obesity rates amongst 4-5 year olds is highest among children from Black African, Black other, and Mixed: White and Black African ethnic groups.
- Obesity prevalence in the most deprived 10% of areas in England is more than twice the prevalence in the least deprived 10%.



Figure 4.7

## People on lower incomes appear to be heavier despite consuming less<sup>130</sup>



Team analysis of years 7, 8 and 9 of the National Diet and Nutrition Survey.



# **Socio-demographic characteristics, diet and health among food insecure UK adults: cross-sectional analysis of the International Food Policy Study**

## **Methods**

- Weighted cross-sectional survey
- 2,551 participants – UK adults (age 18-64 years)

## **Odds of Food Insecurity higher in:**

- Full time students versus non-students (OR 3.23)
- Single parent households versus households without children (OR 2.10)
- Low versus high levels of education (OR 2.30)
- Male compared to female (OR1.36)
- Ethnicity as mixed (OR 2.32) or White Other (OR 2.04) versus White British

## **Food insecure adults demonstrated to have:**

- lower odds of consuming fruits (OR 0.59) and vegetables (OR 0.68)
- higher odds of reporting unhealthy diets (1.65),
- increased risk of poor general health (OR 1.90),
- increased risk of experiencing poor mental health (OR 2.10)
- increased risk of high stress (OR 3.15)
- increased risk of overweight (OR 1.32)

- Wave 1 of International Food Policy Study - Adults 18-64 years (n= 2551 overall; n=1949 for FI & BMI analysis)

**Weight adjusted to be representative of UK population**

**FI measured with USDA Adult Food Security Survey Model**

**Adjusted logistic regression– sex, age, ethnicity, household composition**

Yau, A., White, M., Hammond, D., White, C., & Adams, J. (2020). Socio-demographic characteristics, diet and health among food insecure UK adults: cross-sectional analysis of the International Food Policy Study. *Public Health Nutr*, 1-13. doi:10.1017/



# Dietary Quality and Food Insecurity

Topic area	Papers	Key Findings
<b>Fruit and vegetable consumption in adults &amp; FI</b>	<b>2</b>	<ol style="list-style-type: none"> <li>1. Systematic review to look at environmental influences on F&amp;V consumption in adults. Authors found low income associated with lower fruit and vegetable intake. Found <b>very limited evidence on fruit and vegetable consumption and food insecurity specifically</b>, although 1 study found lower fruit consumption associated with FI. (Kamphuis et al., 2006)</li> <li>2. <b>Food-insecure adults consumed fewer vegetables, fruit, and dairy products than did food secure adults and had lower intake of vitamins A and B-6, calcium, magnesium, and zinc.</b> In children, 130 associations were tested, and 21 associations (16%) showed an adverse association. Substantial evidence of only lower fruit consumption in food-insecure compared with food-secure children. (Hanson et al. 2014)</li> </ol>
<b>Dietary quality consumed by food pantry users (USA, Canada, France, Australia)</b>	<b>1</b>	<ul style="list-style-type: none"> <li>• Systematic review of 15 articles of 11 studies investigating the <b>dietary quality of food bank and pantry users</b></li> <li>• <b>Mean intake of dairy found to be below recommendations in all studies; mean intake of fruit and veg was found below recommended levels in all but one study, and meat intake was found to be adequate in all studies.</b></li> <li>• Mean intake of vitamins A and C were found to be adequate, as was mean intake for vitamin E, folate, niacin, riboflavin, thiamin, sodium and phosphorous</li> <li>• <b>Mean intake of vitamin D, iron, magnesium, selenium and zinc in women were lower than recommended levels.</b></li> </ul>

# Food Insecurity & Poor diet: What are the links?



**THE AFFORDABILITY  
OF FOOD**



**PRACTICAL  
CONSIDERATIONS**



**EMOTIONAL  
BANDWIDTH**





# Affordability of food

**Healthy food has been shown to be 3x as expensive as unhealthy food. (Calorie for calorie basis)**

**Eatwell Plate diet – unaffordable for many families with estimates of it requiring up to 42% of post-housing budget to supply.**

**Food consumed in the UK is the cheapest across all Western Europe.**

**Risk of uneaten food = wasted money**





# Practical Barriers

- **Equipment**
- **Energy costs**
- **Limited storage space**
- **Cost of travelling**





# Emotional Bandwidth

**Emotional bandwidth – ability to focus past immediate needs.**

**Emotional impact of food insecurity: “Some costs are intangible, including those related to pain and suffering, poor quality of life and emotional distress.” (HOL 2020, p.2019)**

**Stress makes it very difficult for many to acquire new skills – eating itself may become a low priority.**



## **Why don't people just make soup?**

- **Persuade family that they might like soup**
- **Need to acquire a recipe**
- **Ingredients to purchase – maybe need to travel to find them**
- **Local shop may only offer small quantities (higher cost/unit)**
- **Shop will have other easier (less healthy) options on display, possibly with promotions**
- **Kitchen equipment required for recipe may not be adequate**
- **Following a new recipe (especially if new skill) may be stressful and time consuming**
- **If soup goes wrong, or if household members don't like it then a second meal may be needed. Wasted money.**

**Separately, these issues may be manageable. Together they represent a true barrier to accessing a healthy diet.**

**“When there are so many easy, cheap and reliable alternatives available, this process is a distinctly unappealing proposition.”**



# Thank you.

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