Household food insecurity in the UK: data and research landscape

Maes o ddiddordeb ymchwil: Food insecurity
Hyd yr astudiaeth: 2022-09-01
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Awduron: Hannah Lambie-Mumford, Rachel Loopstra, Alex Okell
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This evidence scoping review identifies the landscape of research and data on Household Food Insecurity in the UK, covering that produced by academia, government departments and wider civil society. It identifies existing data, research questions and approaches in relation to Household Food Insecurity and also identifies the key gaps in the evidence base.

The key research themes focused on were:

1. Definition, concept and measurement of food insecurity
2. Drivers of individual/household-level food insecurity
3. Experiences of different population sub-groups
4. Outcomes/consequences of food insecurity including those related to food safety
5. Responses to food insecurity at the national/local level (including those by third sector organisations and local and national governments)

Household food insecurity in the UK: 1. Acknowledgements

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Household food insecurity in the UK: 2. Acronyms

- Adult Food Security Survey Module (AFSSM)
- Biotechnology and Biological Sciences Research Council (BBSRC)
- Child Poverty Action Group (CPAG)
- Department for Environment Food and Rural Affairs (DEFRA)
- Department for Work and Pensions (DWP)
- Economic and Social Research Council (ESRC)
- Family Resources Survey (FRS)
- Food and Agriculture Organization of the United Nation (FAO)
- Food Standards Agency (FSA)
- Food Standards Scotland (FSS)
- Free School Meals (FSM)
- Holiday Activities and Food (HAF)
- Independent Food Aid Network (IFAN)
- Index of Multiple Deprivation (IMD)
- Joint Strategic Needs Assessment (JSNA)
- Joseph Rowntree Foundation (JRF)
- Local Government Association (LGA)
- Lower Layer Super Output Areas (LSOA)
- National Diet and Nutrition Survey (NDNS)
- National Institute for Health and Care Research (NIHR)
- Office for Standards in Education, Children's Services and Skills (Ofsted)
- Organisation for Economic Co-operation and Development (OECD)
- Strategic Priorities Fund (SPF)
- UK Longitudinal Household Survey (UKLHS)
- UK Research and Innovation (UKRI)
- United States Department of Agriculture (USDA)
- Universal Free School Meals (UFSM)

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Household food insecurity in the UK: 3. Executive Summary

To inform the Food Standards Agency (FSA)'s approach to future collaborations and research priorities related to household food insecurity in the UK, an evidence-mapping exercise was commissioned over September 2022 to March 2023. The exercise was designed to give the FSA an overview of household food insecurity data and the landscape of the type of research questions related to food insecurity that have been explored in the UK context. More specifically, the aims of the project were: (1) to scope the landscape of research and data on household food insecurity in the UK, covering that produced by academia, civil society, and government departments and including publicly available datasets, (2) to identify the key gaps in the research landscape and inform priorities for the FSA's work on household food insecurity going forward. Systematic searches for academic papers and reports were undertaken on academic databases, government websites and Google.

The key research themes focused on were:

1. Definition, concept and measurement of food insecurity
2. Drivers of individual/household-level food insecurity
3. Experiences of different population sub-groups
4. Outcomes/consequences of food insecurity including those related to food safety
5. Responses to food insecurity at the national/local level (including those by third sector organisations and local and national governments)

Importantly, the task was not to describe the findings of this large body of research, but rather to identify the landscape of research questions asked in relation to food insecurity and the approaches taken to answer these. In addition to identifying published papers and reports, the search strategy was also applied to major UK-wide funder databases (namely, UKRI, NIHR, Leverhulme) to identify recent/current projects funded in relation to food insecurity.

3.1 Overview of returns

Searches were conducted over October 2022 to December 2022. The largest number of search returns fell into the theme of responses to food insecurity (Figure 1). In total, 80 items were returned under this theme. A total of 59 items were returned on definition, concept or measurement of household food insecurity, whilst 44 returns fell into the theme of risk factors for individual/household level food insecurity. The theme of outcomes associated with food insecurity had 21 returns. The smallest number of returns fell under the theme of experiences of different population groups, which had 19 returns. The searches also returned a number of recently funded research projects on food insecurity. Across all themes, a total of 24 projects related to food insecurity funded over 2017 to 2022.

Figure 1 Overview of search returns by theme and publication type.

3.2 Research and data on food insecurity concept and its measurement

Research on **conceptualisation of household food insecurity and how best to measure it** has included analyses of media content and qualitative research with stakeholders to explore their conceptualisations of food insecurity and responses to the issue. Research has also reviewed different approaches to measurement and assessment of their applicability in the UK context. The FSA UK Public's Interests, Needs and Concerns Around Food project explored the use of different indicators of inadequate and insecure access to food and related food behaviours.

Survey data using experience-based measures of food insecurity has been commissioned and reported on by academics, third sector organisations and government departments. Key survey data sources include the Food Foundation's food insecurity tracking work, which involves regularly commissioned YouGov surveys that include food insecurity measures. Key national-level government surveys currently active include the FSA Food and You 2 survey, the FSA Consumer Tracker, the Department for Work and Pensions (DWP)'s Family Resources Survey (FRS), the Scottish Government's Scottish Health Survey, and the Welsh Government's National Survey for Wales.

Research has also used proxy measures to report on estimated prevalence of food insecurity. **Proxy measures** have included food bank use, poverty and deprivation, food spending, diet quality and dietary compromises, eligibility for free school meals (FSM) and stakeholder perceptions. To estimate local level food insecurity, indices of estimated risk for food insecurity have been developed.

3.3 Risk factors for individual/household level food insecurity

Researchers have used surveys of the general population to identify risk factors for food insecurity. Survey data from the FSA Food and You (Waves 4 and 5) have been used to examine risk factors including the relationship between disability and food insecurity. Food insecurity indicators added to the UK Longitudinal Household Survey (UKLHS)-Understanding Society COVID-19 Survey over the pandemic have been used to explore risks associated with employment transitions, financial strain and socio-economic characteristics. The Food Foundation's YouGov survey data have also been used to explore risk factors for food insecurity during the pandemic.

Proxy indicators of food insecurity have been used to explore differences in food insecurity across groups, areas and in relation to changing policy environments. Trussell Trust food bank use has commonly been used as a source of proxy data for food insecurity, and researchers have used these data to explore associations with benefit sanctioning, roll-out of Universal Credit, area-level socio-demographic characteristics and food bank operating practices. Surveys of people using food banks have been used to explore risk factors, including issues related to Universal Credit, housing, adverse life events, income and financial issues and changes or problems with benefits.

Qualitative research has also explored the risk factors for food insecurity. This has included research with participants recruited from food banks examining the reasons leading people to seek help. Qualitative research has also explored risks of food insecurity related to the impact of the COVID-19 pandemic.

Cross-country datasets have been used to analyse macro-level drivers of food insecurity at a country level. These have included analyses of food prices, wage levels, child benefit policies, wage setting policies and trade liberalisation.

3.4 Research focused on specific sub-groups in the UK population

Families with children, children and young people have been the focus of academic and third sector research. These have included case study research with children, surveys of families with children and a report on the Children's Future Food Inquiry. Research on food insecurity amongst disabled people and people with long-term health conditions has included the Scottish Government's analysis of Scottish Health Survey data and Trussell Trust research on disability, health and food bank use.

Experiences of benefit claimants have been explored through surveys including one commissioned by Trussell Trust of people claiming Universal Credit. Risks of food insecurity amongst low-income women in work has also been explored through analysis of Labour Force Survey data and interviews in the Sheffield City Region. The experiences of older people have been explored through qualitative research involving interviews, visual methods, 'go-along' tours and other ethnographic approaches. Minoritised ethnic groups have also been the focus of research, including work exploring the experiences of UK white British and Pakistani women in Bradford and undocumented migrants in Birmingham.

3.5 Outcomes associated with food insecurity

Only a few studies on the **food safety implications** of food insecurity in the UK context were identified. The existing evidence on food safety in relation to food security was primarily by, or commissioned by, the FSA including analyses of data from the Consumer Insights Tracker and Public interests, needs and concerns around food across the UK, Food and You 2 and qualitative research commissioned into food safety in community food provision.

Research on **dietary and health** outcomes of food insecurity included an analysis of Food and You (Wave 4) looking at fruit and vegetable intake and mental health, and an analysis of a sub-cohort of mothers involved in the Born in Bradford birth cohort study looking at self-rated health. Surveys of adults recruited through convenience sampling approaches have also been used to collect data on food insecurity and dietary outcomes and food habits. Surveys have been conducted with food bank users to explore diet, weight and health. Health and diet outcomes for particular populations have also been explored including the impact of food insecurity during summer school holiday months on parental stress and the relationship between food insecurity

and diet in adults with primary school-aged children. Cross-country research has been undertaken using Gallup World Poll data looking at health outcomes.

3.6 Implementation and impacts of interventions aimed at reducing food insecurity and/or improving food access

Survey data have been used to examine experiences of food insecurity in relation to receipt of **free school meal** replacements when schools were closed during the COVID-19 lockdowns. Cost/benefit analyses of increasing free school meal provision have been published, as has case study research designed to showcase best practices in school food provision. Desk-based research and data collection with stakeholders have been used to explore the roll-out of **universal infant free school meal** provision and survey research has looked at the uptake of school meals. Survey data has been used to explore the impact of the Universal Infant School meals policy on dietary intake.

Experiences of food insecurity during the **school holidays and the impact of holiday programmes** have been explored through quantitative and qualitative research, including evaluation of the Holiday Activities and Food (HAF) programme. This has included parent surveys and interviews, surveys with children and participatory and ethnographic research looking at motivations of volunteers. The impact of **breakfast club provision** on academic attainment has also been evaluated.

The **Healthy Start** programme has been the subject of peer reviewed research that has looked into fruit and vegetable intake, food purchase data and the impact of universal implementation. Qualitative studies with mothers, health professionals and other stakeholders have also explored Healthy Start uptake. The Scottish government have published an evaluation of the Best Starts Foods programme (an alternative to the Healthy Start voucher scheme provided in England).

Many peer-reviewed studies and grey literature reports have focused on the activities of **food banks and other forms of community food provision**, covering a range of research questions and using a range of methods. Research has looked at the different types of provision available (mapping that provision and assessing the nutritional value of the food provided), the role of food banks and food aid (how they operate, perspectives of providers and recipients). Several academic studies have also looked at the relationship between the growth of food banks and austerity policies.

The searches returned several **multi-component/multi actor strategies** and interventions, including local food poverty action plans and a Scottish Government evaluation of the range of support available for low-income households during the COVID-19 pandemic. One example of research looking at the role of **food companies** in responding to household food insecurity was identified.

3.7 Forthcoming Research

A number of funded research projects related to each of the main themes above were identified. The National Institute for Health and Care Research (NIHR) have recently funded several evaluation studies which will be important for improving understanding of the impact of different interventions including universal free school meals (UFSM), school holiday provision and fresh food subsidies. The Economic and Social Research Council (ESRC) and Department for Environment Food and Rural Affairs (DEFRA) funded food system trials and intervention work funded through the UK Research and Innovation (UKRI) Transforming UK Food Systems Strategic Priorities Fund (SPF) will add significantly to the body of research looking at the most effective ways to improve access to food. The searches for research in progress returned a

number of different doctoral projects in the field of household food insecurity including on concepts, experiences of different population groups, and the role of welfare and low income in driving food insecurity and community food assistance.

3.8 Discussion

Our searches identified a range of research and reporting on household food insecurity related to the themes explored for this review (Figure 2). There are now a variety of data and analyses of food insecurity that have used both quantitative and qualitative approaches to better understand the experience, its measurement, what puts households at risk, and interventions that might make a difference to households' ability to access food. However, there are some important gaps in this research landscape including a need to compare different survey instruments and survey methods in use in the UK to aid in understanding of the data that they produce, better data on local level food insecurity, more research on how interconnected social characteristics such as gender, ethnicity, and age relate to risk of food insecurity, more research on social and development outcomes in relation to food insecurity, and more evaluation on the potential prevention and mitigation of food insecurity through various programmatic and policy interventions.

3.9 Potential future research for the Food Standards Agency

Of the research gaps identified in this landscape, the FSA could consider building on the work they already have done to:

1) Expand analyses of data collected through Food and You 2 to better understand risk factors for food insecurity and how food safety and food hypersensitivities associate with the experience.

2) Further explore the food safety-related practices of community food providers in relation to use of surplus food.

3) Further understand the use and interpretation of different survey measures of household food insecurity in the UK.

Figure 2 Key themes and sub-themes identified from searches.

Household food insecurity in the UK: 4. Introduction

Household food insecurity is a widely used concept in high-income countries to describe "uncertainty about future food availability and access, insufficiency in the amount and kind of food required for a healthy lifestyle, or the need to use socially unacceptable ways to acquire food." (Anderson, 1990). In the UK, research focused on food insecurity was relatively rare before the rapid spread of food banks and growing usage from 2010 but since then, has burgeoned (Loopstra and Lambie-Mumford, 2023). There was very little peer-reviewed literature on the topic in the UK when DEFRA commissioned a Rapid Evidence Assessment of evidence on food aid in the UK (Lambie-Mumford et al 2014), but there is now an established field of research on household food insecurity and responses to it that spans disciplines including public health and nutrition, social policy, politics, geography, food policy and systems. Government monitoring of food insecurity has also evolved over this time, with the FSA first including a food insecurity measure into the Food and You survey in 2016, and the DWP including the same in the FRS from 2019/20. The Agriculture Act 2020 requires the UK government to report on food security to Parliament at least once every three years, and the UK Food Security Report that is produced to fulfil this duty now includes reporting on data from these government surveys (Department for Environment, Food & Rural Affairs, 2021). This rapidly developing field has resulted in a varied landscape of research and evidence on food insecurity.

The FSA has an interest in advancing its research on household food insecurity in the UK as part of its strategy. The FSA works to protect consumers' wider interests in relation to food, and the FSA strategy 2022-2027 recognises that people are worried about food affordability and

insecurity and therefore they will continue to consider the impact of these issues across all work.

To inform the FSA's approach to future collaborations and research priorities on food insecurity in the UK, it was deemed a priority to first gain greater clarity on the scope of the research landscape already in existence in the UK. Thus, this research was commissioned to give the FSA an overview of household food insecurity data and the landscape of the type of research questions related to food insecurity that have been explored in the UK context. More specifically, the aims of the project were:

1. to scope the landscape of research and data on household food insecurity in the UK, covering that produced by academia, civil society, and government departments and including publicly available datasets; and
2. to identify the key gaps in the research landscape and inform priorities for the FSA's work on household food insecurity going forward.

Importantly, the task was not to describe the findings of this large body of research, but rather to identify the landscape of research questions asked in relation to food insecurity and the approaches taken to answer these. The areas focused on were research on definition, concept and measurement of food insecurity, drivers of individual/household-level access to food, experiences of different population sub-groups, outcomes related to food insecurity including those related to food safety, and responses to food insecurity at the national/local level (including those by third sector organisations and local and national governments).

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Household food insecurity in the UK: 5. Methods

5.1 Search Strategy

A systematic search strategy was used to identify published papers and reports on food insecurity in the UK. Peer-reviewed journal articles, government reports, third sector commissioned surveys and grey literature reports were all of interest. To gain insight into likely forthcoming publications, we also included research projects funded by national research funding bodies.

Food insecurity can be defined, referred to, and measured in different ways. For this exercise, we sought to include publications that focused on the experience of households or individuals lacking regular access to enough safe and nutritious food due to a lack of resources (FAO, 2022). As the term "food insecurity" is not always used to describe this experience, we used a wide range of key terms which have been used interchangeably with the term food insecurity in the UK context or which describe a lack of access to food, including "food poverty" and "hunger". These were used to identify any research related to the experience in the UK context relating to measurement, understanding drivers of the experience or outcomes associated with it, and vulnerability among specific subgroups in the population. In a second round of searches, a set of keywords specifically focused on programmes responding to food insecurity in the UK context were used. These included free school meals, breakfast and holiday clubs, food banks and other kinds of community food interventions, Healthy Start vouchers, and food poverty action plans.

Key terms were agreed upon with the FSA (see Appendix A for the full list) and keyword searches were conducted (from October 2022 to December 2022) across relevant databases and search engines (see Appendix B). Key terms were truncated to provide optimal search results. This widened the search to include varied, relevant word endings. These searches were complemented by a scan of citations in returned research, as well as by scanning related articles on publisher websites.

Lastly, we also used the same search terms to search UK-wide key funder's directories of funded research. These were: UKRI, NIHR, the Wellcome Trust, and the British Academy. We sought to identify research funded from 2017 on topics related to food insecurity and responses to it to gain an understanding of the landscape of research being currently funded on these topics.

5.2 Inclusion and Exclusion Criteria

All searches were limited to the English language. Only literature published between 1st January 2017 to end of December 2022 was included. This timeframe was chosen as the FSA had a particular interest in understanding the current research landscape and data available. It was important to include studies conducted prior to the COVID-19 pandemic and current inflationary period to understand the kinds of research being conducted before these major shocks occurred. We did not include literature reviews unless they were exclusively focused on the UK context. Publication lists from reviews were scanned and any citations that matched our search criteria were included in results of our search. We also excluded commentaries or analyses that were not based on empirical research or data.

We included research where food bank use was used as a proxy measure for food insecurity and/or where research has focused on the food insecurity experiences of people using food banks. However, it is important to acknowledge that many people who experience food insecurity do not use food banks and thus, this research may not reflect the experiences of the wider population of households experiencing food insecurity (Loopstra and Lambie-Mumford, 2023).

5.3 Screening Strategy

Each abstract or report summary was screened against the exclusion criteria. Items were not included if, for example, it originated from the UK but focused on food insecurity in other countries. Items focused solely on the food system, sustainability, food policy (other than food insecurity or food access policies aimed at households/individuals), or on improving diets/nutritional outcomes without mention of food insecurity/food access were not included. Results were filtered by the project research assistant and further checked by the research team before being added to a database. Returns were categorised into 4 groups: peer-reviewed journal articles, government reports, grey literature reports or research funded by a major UK national funder.

5.4 Data Analysis

Paper and report titles, abstracts, and/or summaries were reviewed to code the publications into five pre-defined main themes:

- Definition, concept and measurement of food insecurity
- Drivers of individual/household-level food insecurity
- Experiences of different population sub-groups
- Outcomes/consequences of food insecurity including those related to food safety
- Responses to food insecurity at the national/local level (including those by third sector organisations and local and national governments)

Under each of these main themes, subthemes were identified based on a review of abstracts, research aims, and methods. Descriptions of publications falling under each sub-theme are grouped by the categorisation above (i.e. peer-reviewed journal articles, government report etc).

An initial review of the search results was presented to the FSA in December 2022. Search terms were then refined and adapted to make sure we had identified the full scope of available publications, and supplementary searches for government data and research and grey literature were carried out. The FSA advised on themes of particular interest at this stage. As there was little evidence on the relationship between food safety and food insecurity in the UK context, we decided to widen the search criteria to include international literature on this topic to enable a description of the types of research carried out in other country contexts on this topic.

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Household food insecurity in the UK: 6. Results

The largest number of search returns fell into the theme of responses to food insecurity. In total, 59 items were returned under this theme, including 29 peer-reviewed academic papers, 24 grey literature reports and six government reports. A total of 46 items were returned on definition, concept or measurement of household food insecurity, including 20 government reports, 17 peer-reviewed papers and 9 grey literature reports, whilst 42 returns fell into the theme of risk factors for individual/household level food insecurity, including 26 peer-reviewed papers and 16 grey literature reports. The theme of outcomes associated with food insecurity had 25 returns (n=18 peer-reviewed papers, one grey literature report and six government reports). The smallest number of returns fell under the theme of experiences of different population groups which had 21 returns (n=14 peer-reviewed papers and 7 grey literature reports).

According to our search returns, most of the government reports that were identified (n=20 of 32) fell into the definition/concept and measurement theme, compared to no government reports for risk factors or experiences of different population groups. In terms of peer-reviewed research, the highest numbers of returns were around responses to food insecurity (n=59) and risk factors for individual/household level food insecurity (n=42). The other themes had similar amounts of peer reviewed studies returned: outcomes associated with food insecurity (n=18), definition/concept and measurement (n=17), experiences of different population groups (n=14). Grey literature reports focused mostly on responses to food insecurity (n=24) or risk factors (n=16), with only one report returned on outcomes associated with food insecurity, seven on experiences of different groups and nine on definition/concept and measurement.

6.1 Research and data on food insecurity concept & its measurement

Summary

Research on **conceptualisation of household food insecurity and how to measure it** has included media analyses of public understanding, perception and discourse, as well as qualitative research with health and social care practitioners and other stakeholders on the nature of food insecurity and responses to the issue. Research has also reviewed different approaches to measurement and assessment of their applicability in the UK context. The FSA UK Public's

Interests, Needs and Concerns Around Food project used a bespoke approach to measurement, designed to get a comprehensive overview of food behaviours.

Survey data using experience-based measures of food insecurity has been commissioned and reported on by academics, third sector organisations and government departments. Key survey data sources include the Food Foundation's food insecurity tracking work, which involves regularly commissioned YouGov surveys that include food insecurity measures. Key national-level government surveys currently active include the FSA Food and You 2, the FSA Consumer Tracker, the DWP's FRS, the Scottish Government's Scottish Health Survey, and the Welsh Government's National Survey for Wales.

Research has also used **proxy measures** to report on estimated prevalence of food insecurity. Proxy measures have included food bank use, poverty and deprivation, food spending, diet quality and dietary compromises, eligibility for FSM and stakeholder perceptions. To estimate local level food insecurity, indices of estimated risk for food insecurity have been developed.

6.1.1 Conceptualisation and how to measure

Peer-reviewed journal articles

Douglas et al (2018) used in-depth interviews with 25 frontline health, social care and third sector professionals in Scotland to explore their perceptions of the nature of food insecurity and their understandings of responses to the issue. In Beacom et al. (2021a), qualitative interviews with stakeholders from Northern Ireland including consumer representatives, community practitioners, policymakers/policy officers, national representatives, local council representatives, academics and public health representatives were held to gather perceptions of risks and consequences of food insecurity. They used previously devised frameworks for food insecurity to inform their research questions, with an added element of exploring what impacts food insecurity might have on businesses. The same authors also conducted a rapid evidence review of different approaches to measuring food insecurity used globally (Beacom et al., 2021b). They aimed to identify approaches to measurement and commonalities across them, discuss findings from different approaches to measurement, and use the data available to assess the appropriateness of adoption of the USDA's Household Food Security Survey Module in the UK. This work was complemented by another study by the same authors which included the USDA Household Food Security module alongside questions on food deprivation from the EU Statistics on Income and Living Conditions survey in the Northern Ireland Health Survey in order to identify differences between the measures (Beacom et al. 2021c). Stakeholders' perspectives on these different survey instruments were also examined in another paper (Beacom et al., 2022).

Content analyses of mainstream and social media have also been used to understand how food insecurity and food bank use are perceived by the public and media. Yau et al. (2021) conducted an analysis of UK national newspaper print and online content over 2016 to 2019 to quantify the extent to which food insecurity and food bank use was featured in UK news media and how the nature of the problem was described, as well as drivers and solutions. Price et al. (2020) focused their analyses on online news media coverage of food bank use in the West Midlands region, also including an analysis of the content of the below-the-line comments over 2010 to 2019. The discourses portrayed in the news stories were contrasted with reactions to these stories from the below-the-line comments.

Views from the public were also analysed by examining content on social media, namely, Twitter, in the early months of the COVID-19 pandemic (Eskandari et al., 2022). Tweets related to food and poverty were analysed to identify most common words used in tweets and how different words were paired. These were analysed to examine perceptions of risk in the population and reasons for it.

Here, we also mention qualitative studies that have explored how food bank use, and in turn, food insecurity (or hunger) has been framed and conceptualised. Williams and May (2022) conducted an analysis of data from local and national newspaper archives and data from Companies House, the Charity Commission, and internet archives, to trace a genealogy of food banks and their practices in the UK. Strong (2022) analysed three popular images of "Food Bank Britain" to identify their portrayal and the messages they convey about the rise of food banks in Britain. Briggs and Foord (2017) offer their analysis about the development, impact and scope of food banks in Britain, though it was not clear what methodological approach or data they used to form these arguments.

Government reports

The FSA and Food Standards Scotland (FSS) commissioned research published in 2022 on The UK Public's Interests, Needs and Concerns Around Food (Connors et al., 2022). In addition to conducting interviews, this research included an online survey of 6175 respondents, which used a bespoke approach to measuring food insecurity, built upon an adapted version of the USDA food insecurity measure. It was designed to provide a comprehensive view of the range of food behaviours that people experience in relation to financial pressures, and to understand the tipping point between those less food secure and those more food secure. It included a module modelled after the 6-item Short Form of the USDA Adult Food Security Module, but also additional questions aimed at capturing "softer" measures of financial pressure and insecurity and the food behaviours that may result (Connors et al., 2022).

Research projects funded by national funding bodies

The ESRC has funded doctoral research at the University of York that is examining how a rights-based approach can be conceptualized and applied at the city level to address food insecurity. The project takes York as a case study and uses a mix of socio-legal research methods (PI: Leung; funded in 2022).

6.1.2 Commissioned survey data using experience-based measures of food insecurity

Academic-commissioned surveys and related peer-reviewed journal articles

Before food insecurity measures were added to household surveys commissioned by government departments, omnibus panels run by survey companies and commissioned by academic researchers have been a source of data on food insecurity used by researchers. Pool and Dooris (2022) used the Ipsos-MORI's CAPIBUS survey (their face-to-face omnibus survey) to examine the prevalence of food insecurity as measured by the Food and Agriculture Organization of the United Nation's (FAO) Food Insecurity Experience Scale (FIES) in the sample of 2000 UK adults in 2019. They compared their data to the data from the FAO's measure of food insecurity for the UK from the Gallup World Poll over 2016 to 2018 to obtain a sense of whether food insecurity was already increasing prior to the COVID-19 pandemic.

As part of the International Food Policy Study, the USDA Adult Food Security Survey Module (A FSSM) was included on a questionnaire administered to the online Nielsen Consumer Insights Global Panel in 2017 (Yau et al., 2020). Researchers used data from the approximately 2550 UK adults included in the survey who completed the food security module and health questions in their analysis. They reported on food insecurity prevalence in this sample, as well as reporting on socio-demographic correlates and health outcomes associated with food insecurity, discussed later.

Government-commissioned surveys and related reports

In 2016, the FSA's Food and You (Wave 4) survey, a face-to-face nationally-representative survey of adults in England, Wales, and Northern Ireland, was the first government survey to measure household food insecurity among respondents in the past 12 months using the USDA A FSSM (Bates, 2017). The AFSSM was included again in Wave 5 of the same survey in 2018. The Food and You survey was re-designed over 2019, and evolved into Food and You 2, a push-to-web biannual survey of over 6,500 adults from over 4,000 households in the UK. The first wave of fieldwork occurred over July 2020 to October 2020 and a total of five waves of data have now been published, with the most recent, Wave 5, covering fieldwork conducted over April to July 2022 (Armstrong et al., 2023). Regular reports summarising each wave of Food and You 2 are produced by the FSA; waves of data are also combined to enable reports focused on Northern Ireland to be produced.

Evidence from Food and You 2 and the Consumer Insights Tracker were used in the FSA's collation of their evidence on food insecurity and food affordability: Household Food Insecurity: main report. This paper was presented to the FSA Board in June 2022 (Pettifer and Patel, 2022). Research commissioned by FSA has also drawn on the FSA's food insecurity data from Food and You 2 and the Consumer Insights tracker in a piece of research on food practices (FSA, 2022b). The Trussell Trust's commissioned research "State of Hunger" also used data from Food and You Wave 5 in their analysis of food insecurity in the population (Bramley et al., 2021).

The FSA also runs a Consumer Insights Tracker, which is a monthly tracker that has included one question from the USDA's AFSSM since 2021, allowing monthly tracking of adults reducing the size of meals or skipping meals for financial reasons (among other reasons). It also monitors food availability along with consumer concerns and confidence in the food chain, with results published monthly (FSA, 2022a – Consumer Insights Tracker). This tracker superseded the COVID-19 consumer tracker which ran for 19 months from April 2020 to October 2021 (FSA, 2021).

Since 2019, the FRS, a nationally representative household survey managed by the DWP and covering the whole of the UK, has also included the USDA AFSSM, though it uses a 30-day recall period, rather than the 12-month recall period used by the FSA (DWP, 2022a).

Data from the FRS and Food and You 2 are drawn on by other government departments including DEFRA in the UK Food Security Report (DEFRA, 2021) which contains a chapter on Food Security at a Household Level (Theme 4). This cites data on household food insecurity from the FRS and Food and You 2, but the intention is to use the FRS 'as the only source for future iterations of the UKFSR'. FRS data on household food insecurity are also cited in the DEFRA Food Statistics Pocketbook (DEFRA, 2022). The DWP publish findings from the FRS, including on household food insecurity, annually (DWP, 2022a), and these food insecurity data are also included in DWP research on Households below average income (DWP, 2022b).

The Office for Health Improvement and Disparities (OHID) Wider Determinants of Health Dashboard added Household Food Insecurity data in May 2022 (Office for Health Improvement and Disparities, 2022). This dashboard uses data from the FRS and reports on prevalence of food insecurity by region across the UK.

Agencies and departments within the devolved nations have also been tracking food insecurity. The Scottish Government's Scottish Health Survey includes three questions from the FAO's Food Insecurity Experience scale (Food and Agriculture of the United Nations, 2018), another validated survey instrument for measuring food insecurity, which also uses a 12-month recall period (Scottish Government, 2022). The poverty and deprivation section of the National Survey for Wales has several questions relating to access to food, some of which have come from the USDA or FAO food security measurement modules, although the full modules have not been included (Welsh Government, 2023). Questions included relate to using food banks, skipping meals or going at least one day in the previous fortnight with no substantial meal. The Public Health Wales report on Rising to the Triple Challenge of Brexit, COVID-19 and Climate Change for health, well-

being and equity in Wales, draws on household food insecurity data from the FSA (Food and You 2) and other sources in order to understand the impact of these challenges on national and household food insecurity in Wales (Green et al., 2021).

The Survey of Londoners, a survey commissioned by the Mayor of London in 2018-19 and 2021-22, has included the short form of the USDA household food security module and the USDA's Child Food Security module1 (Greater London Authority, 2019 and Greater London Authority, 2022). Data from the Survey for Londoners has been cited in reports focused on describing the prevalence of food insecurity in London, or particular areas in London, including the London Children's Food Insecurity Briefing & #Right2Food Charter (The Food Foundation, 2021). Another example of food insecurity measurement at the local level was the Bristol Health and Wellbeing Profile 2021/2022, which included data on household food insecurity measured by the FAO's Food Insecurity Experience Scale and collected through the Quality of Life survey (Bristol City Council, 2022).

Parliamentary reports

Some early Parliamentary reports used the FAO's Gallup World Poll data to report on food insecurity in the UK prior to measurement in UK household surveys. These included the House of Commons Environmental Audit Committee (2019) report on Hunger, malnutrition and food insecurity in the UK report explored the Government's progress against Sustainable Development Goal 2 (Zero Hunger) (House of Commons, 2019). It drew on data available at that time, including food insecurity statistics published by the Food Foundation from the FAO. The House of Commons Children's Future Food Inquiry cites UNICEF data on food insecurity in the UK (Finlay et al., 2019).

More recently, the House of Commons Library published a research briefing titled Food Poverty: Household, food banks and free school meals which cites data from the Food Foundation and DWP FRS (Francis-Devine et al., 2022).

Third-sector commissioned surveys and related grey literature reports

Since the COVID-19 pandemic, the Food Foundation have been regularly tracking household food insecurity, with a particular focus on reporting for households with children (The Food Foundation, 2023). Their measure uses three moderate to severe questions from the USDA A FSSM but questions were adapted to specify non-financial reasons for adults not being able to access food, owing to the conditions at the time of the COVID-19 pandemic. These data have been used to understand vulnerability to food insecurity since the COVID-19 lockdown, described in later sections.

The Social Market Foundation commissioned a survey of 1,000 parents asking questions related to child hunger, based on the USDA Household Food Security Survey Module (Bhattacharya and Shepherd, 2020). They then developed a modelling strategy to enable estimation of levels of food insecurity among households with children for local authorities. Their model drew on area-level data on risk factors for food insecurity and aggregated national and regional estimates from their own data and Food Foundation data. The results of the modelling produced a heat map that models levels of child food security by local authority.

The Joseph Rowntree Foundation (JRF)'s Poverty in Northern Ireland (Birt and Matejic, 2022) report cites FRS data on food insecurity in exploring the rates of poverty in Northern Ireland and assessing the impact that poverty is having on the lives of people who live in Northern Ireland.

The JRF also conduct research on destitution, which includes an element of food insecurity, as they define destitution as: 'not being able to afford the absolute essentials that we all need to eat, stay warm and dry, and keep clean' (Fitzpatrick et al., 2020). Their research has included secondary analyses of large datasets, an omnibus survey of 2,000 members of the public, and

individual case studies. The research incorporated food as one of six key indicators that were measured, specifically whether people had ‘fewer than two meals a day for two or more days’ (Fitzpatrick et al., 2020).

Over 2019 to 2021, the Trussell Trust commissioned a piece of research called the State of Hunger (Bramley et al., 2021). One aspect of this research was a survey of people using food banks in the Trussell Trust network (mid-January to mid-March 2020) which included the adult version of the Household Food Security Module, asking about food insecurity over the past 12 months.

Another JRF report, Poverty in Scotland 2022, involved a survey of 4,196 adults aged 18+ in Scotland online between 11 July and 2 August 2022 which included questions on shopping, preparing and eating food, but did not use a household food insecurity module (Cebula et al., 2022). An earlier 2021 report by JRF on poverty in Scotland involved a poll of 2,016 Scottish adults (aged 16 and over) between 16 February and 22 February 2021, which asked about being able to pay for essentials including food (Birt and Milne, 2021).

More recently, survey data commissioned by third sector organisations have been used to explore levels of food insecurity during the “cost of living” crisis. London Data Store published a report in August 2022 based on a poll of 1245 adults (the survey ran 15th-20th July 2022) which captured data on whether they had ‘regularly or occasionally been unable to buy food or essential items or relied on outside support in the last six months (Watson et al., 2022). JRF (Schmuecker and Earwaker, 2022) has also recently published research on managing the cost of living on a low income. They commissioned Savanta ComRes to conduct a survey among 4,000 low-income households (bottom 40% of income distribution) over May to June 2022. They included two questions from the AFSSM and also a question about food bank use to identify households struggling to afford basic essentials.

6.1.3 Publications reporting on prevalence of food insecurity using proxy measures

Peer-reviewed journal articles

Prior to regular measurement of food insecurity in the Scottish Health Survey, researchers from Scotland examined what data were available for Scotland that could provide insight into concerns about rising food insecurity in years since the 2008 recession (Ejebu et al., 2018). They used Living Costs and Food Survey data to examine food spending and dietary quality relative to incomes and also examined differences in dietary quality from the Scottish Health Survey. They assessed whether these data were adequate to capture different dimensions of the food insecurity experiences, namely, qualitative and quantitative dietary compromises and social and psychological manifestations.

At present, government departments and agencies are now measuring food insecurity on regular household surveys (as outlined below), so there is little need for proxy measures to estimate national-level prevalence of food insecurity. However, the national data are only disaggregated to the regional level for public use, thus, there remains a lack of data on local level food insecurity (Shaw et al., 2022). For this reason, researchers have sought to create indices of risk factors for food insecurity to estimate potential differences in food insecurity prevalence rates across the UK. This was first done by Smith et al. (2018) who conducted stakeholder interviews to inform the creation of indices of estimated risk for food insecurity. These were created based on two domains: (1) demographic profiles, where pensioners living alone, households with dependent children, and low-income lone parent households were viewed as groups at highest risk of food insecurity; and (2) benefit claimant data. More recently, updated indices were created, again informed by stakeholder interviews and a literature review (Smith et al., 2022). Data used to construct a simple index included the number of benefit claimants at the Lower layer Super

Output Areas (LSOA) level in 2020 and percentage of lone pensioners or lone adults or adults with dependent children on low incomes based on Census 2011 ? A Complex Index further included data percentage of adults without educational qualifications based on Census 2011 data and mental health score from the Index of Multiple Deprivation (IMD) 2019 health domain, as well as data on access to public transport, travel time to employment centres, bus stop density and local internet speeds, intended to reflect access to local services. These indices were used to create final ranks of LSOAs for the indices and domains for food insecurity, which are available online (https://mylocalmap.org.uk/iaahealth/).

The perceptions of levels of food insecurity among nursery managers has also been used as a proxy measure of area-level food insecurity (Benjamin Neelon et al., 2017). Data from the food sharing app, Olio, has also been used to examine how food sharing behaviour relates to deprivation indices, with the idea that data from this app may be used to approximate local level food insecurity (Nica-Avram et al., 2021).

Eligibility for FSM is often used as an indicator of food insecurity among children. Whilst we didn't find any studies examining the extent to which free school meal receipt is a good proxy for directly measured food insecurity, researchers have examined whether free school meal receipt is a good proxy for a pupil's socio-economic disadvantage and the extent to which it identifies children living in deprived households (Ilie et al., 2017). A similar study was also carried out using data from the Millennium Cohort Study in Wales (Taylor, 2017).

Government reports

The FSA in Northern Ireland has estimated the cost of a food basket that is nutritionally adequate, realistic and acceptable for four low-income household types in Northern Ireland (NI) in 2020 (Food Standards Agency, 2021). In addition to reporting on experience-based measures of food insecurity in the Food Statistics Pocketbook and UK Food Security reports, DEFRA also report on the food expenditure among low income household, trends in food purchases for low income households over time, the proportion of the population that can reach a food shop within 15/30 minutes and on take-up and eligibility of Healthy Start and Free School Meals (DEFRA, 2021; DEFRA, 2022).

Our searches returned a number of local food poverty action plans, which included needs assessments. In London, these included Barnet Council (2019), that commissioned research involving secondary data analysis and spatial analysis, supplemented by focus groups with front line staff and third sector organisations, and adding questions to a healthy weight survey. The Fairer Food Southwark action plan draws on Food Foundation reports and local Trussell Trust food bank data (Southwark Council (2019). The Birmingham food system strategy 2022 to 2030 was co-produced with local stakeholders and draws on existing sources of evidence including FAO data, Trussell Trust food bank data and un-referenced local data (Birmingham City Council, 2022). Sheffield City Council (2021) used existing data and had a call for evidence. Towards a Fairer North Lanarkshire: tackling poverty strategy included indicators on food bank use and wider data on poverty and deprivation (Campbell, 2020), as did the Food Insecurity In Suffolk report (Healthy Suffolk, 2021). The Southwark Public Health Division (2019) Joint Strategic Needs Assessment (JSNA) reports food insecurity data from the Survey of Londoners, as well as proxy measures including poverty and deprivation, unemployment, benefits and low income and obesity.

Grey literature reports

The Trussell Trust publish annual statistics on the number of times children and adults receive food parcels through their network is another example of a proxy measure commonly used to track food insecurity in the UK (The Trussell Trust, 2022). These data are used to show trends in food parcel distribution and also differences in the levels of distribution at the local authority area level. The State of Hunger report published by the Trussell Trust also reported on these data as

well as on data from the Independent Food Aid Network (IFAN) to estimate levels of food bank use across both Trussell Trust and non-Trussell Trust food banks (Bramley et al., 2021).

In November 2022, the Consumer Data Research Centre, in partnership with Which? published the Priority Places for Food Index, which is a composite index that is intended to be used to identify neighbourhoods that may lack accessibility to affordable and healthy food (Consumer Data Research Centre, 2022). The index is based on information on proximity to supermarkets, travel information to supermarkets, availability of online supermarket delivery, propensity to shop online, non-supermarket food provision, car access, area-level income deprivation, free school meal eligibility, Healthy Start uptake, distance to food banks, and fuel poverty. Notably, these data do not estimate levels of risk of food insecurity in local populations, but rank areas in relation to one another relative to where they score on the index.

6.2 Risk factors for individual/household level food insecurity

Summary

Researchers have used surveys of the general population to identify risk factors for food insecurity. Survey data from the FSA Food and You survey (Waves 4 and 5) have been used to examine risk factors including the relationship between disability and food insecurity. Food insecurity indicators added to the UKLHS -Understanding Society COVID-19 Survey over the pandemic have been used to explore risks associated with employment transitions, financial strain and socio-economic characteristics. The Food Foundation's YouGov survey data have also been used to explore risk factors for food insecurity during the pandemic.

Proxy indicators of food insecurity have been used to explore differences in food insecurity across groups, areas and in relation to changing policy environments. Trussell Trust food bank use has commonly been used as a source of proxy data for food insecurity, and researchers have used these data to explore associations with benefit sanctioning, roll-out of Universal Credit, area-level socio-demographic characteristics and food bank operating practices. Surveys of people using food banks have been used to explore risk factors, including issues related to Universal Credit, housing, adverse life events, income and financial issues and changes or problems with benefits.

Qualitative research has also explored the risk factors for food insecurity. This has included research with participants recruited from food banks examining the reasons leading people to seek help. Qualitative research has also explored risks of food insecurity related to the impact of the COVID-19 pandemic.

Cross-country datasets have been used to analyse macro-level drivers of food insecurity at a country level. These have included analyses of food prices, wage levels, child benefit policies, wage setting policies and trade liberalisation.

6.2.1 Risk factors for food insecurity identified from surveys of the general population

Peer-reviewed journal articles

Survey data from the FSA's Food and You, Wave 4, were used to examine risk factors for food insecurity using generalised ordered logistic regression models, where risks of being marginally, moderately or severely food insecure were examined (Loopstra et al., 2019). Household characteristics examined included age, gender, marital status, ethnicity, highest level of qualifications, disability, employment status, presence of children in household and income

(available as income quartiles). They also examined whether risks of food insecurity differed for households depending where they lived (i.e. Northern Ireland, Wales, or one of 9 regions in England). In addition, the data were merged with data from the 2003-2005 Low Income Diet and Nutrition survey to examine differences in the strength of association for risk factors among low-income households between the earlier survey period and the survey data collected in 2016.

Hadfield-Spoor, Avandano and Loopstra (2022) further explored the relationship between disability and food insecurity using merged data from Food and You Wave 4 and Wave 5. They looked at different domains of disability in relation to food insecurity (i.e. physical disabilities, mental disabilities or a combination of both), as well as whether having multiple types of disabilities further heightened risk of food insecurity beyond a binary indicator of disability.

As already highlighted, researchers have also commissioned bespoke surveys from market research companies that allow questionnaires to be distributed to their omnibus panels. In addition to describing the prevalence of food insecurity, these data have been used to examine risk factors for food insecurity. Pool and Dooris (2021) explored socio-demographic factors in relation to food insecurity as measured by the FAO's FIES in the sample of 2000 UK adults. Using logistic regression models, they examined whether age, life stage (grouped into post-family, single, pre-family, or family), education, ethnic origin, area, social grade, home ownership, income, geographical region, rurality (rural, suburban, urban), and/or distance from the coast were associated with food insecurity. Yau et al. (2020) examined a range of socio-demographic characteristics in the Nielsen Consumer Insights Global Panel data in relation to food insecurity, in addition to a measure capturing reported difficulty making ends meet. They also examined whether full-time students were at higher risk of food insecurity compared to non-students.

Socio-demographic characteristics associated with food insecurity have also been explored in a nested study of mothers whose children were recruited into the Born in Bradford cohort (Power et al., 2018). Women were first recruited into the study when they were around 26-38 weeks pregnant over 2007 to 2010, but completed the USDA Household Food Security Module in a questionnaire when their infants were 12-18 months of age. The researchers examined the odds of food insecurity using multivariate logistic regression models, in relation to ethnicity (White British versus Pakistani), cohabitation status, number of people in the household, age, occupation of father in household as a marker of SES (the authors justified this choice because a large proportion of women in the cohort had never been employed), whether or not in receipt of means-tested benefits, level of education, and perception of financial security.

Indicators of food insecurity were added to the UKLHS-Understanding Society COVID-19 Survey over the pandemic, allowing researchers to examine the risks of food insecurity over this period. The indicators used over the COVID-19 survey waves changed with different iterations of the survey but included adapted items from the FAO's FIES/USDA Household Food Security Module, namely, questions about whether respondents and their household members were unable to eat healthy and nutritious meals; were hungry but did not eat; and/or whether they have smaller meals than usual or skipped meals. Koltai et al. (2021) used UKLHS data from the April and July 2020 waves to examine how pre-COVID-19 income quantiles and current socio-demographic characteristics were associated with self-reported inability to eat healthy and nutritious meals and experiences of hunger in the past week. They also examined whether groups who had employment transitions (namely, to furlough or to unemployment) over the first months of the pandemic were more likely to be experiencing food insecurity than those who remained in employment. In a sensitivity analysis, they additionally examined the relationship between subjective financial strain and the indicators of food insecurity they were using in this study.

Brown et al. (2022) also used data from the UKLHS Understanding Society COVID-19 survey to examine socio-economic characteristics associated with risk of food insecurity indicators over the April, July and September waves of the survey. They used the same indicators as Koltai et al. (2021) as described above and explored these in relation to household income, household

ownership, highest level of qualification, long-term illness or disability, young age (defined as 16-30 years) single parenthood, gender and whether or not children of different ages were present in the household. To better understand relationships between socio-economic characteristics and food insecurity during the pandemic, they explored the extent to which reduction in working hours, being behind on bills, or having COVID-19 symptoms explained the association between socio-economic variables and food insecurity.

Many online surveys using convenience samples were administered over the pandemic to explore pandemic-related factors in relation to food insecurity, as well as other outcomes. One study recruited adults living in the UK through social media channels, asking them to complete a questionnaire that included an adapted version of the FAO's FIES, including only three items (namely, inability to access healthy and nutritious meals; household running out of food; skipping meals) (Charilaou and Vijaykumar, 2021). They explored whether different types of media exposure were related to food insecurity during the pandemic. Armstrong et al. (2021) used a survey among Qualtrics users to measure a range of food-related behaviours, including dietary preferences, dietary motivations, cooking habits and skills, and food shopping habits as well as food insecurity. In bivariate analyses, they examined associations between socio-demographic characteristics and food insecurity, as well as some exploratory variables, namely, Body Mass Index (BMI) derived from self-report of height and weight, dietary preferences, cooking confidence, meal planning, and other food practices.

Government reports

The DWP's reporting from the FRS (DWP, 2022a) and the FSA's reporting on data on food insecurity from Food and You 2 (e.g. Armstrong et al., 2023) include examining how prevalence of food insecurity differs across different socio-demographic characteristics. These descriptive statistics identify different subgroups in the population who experience higher levels of food insecurity than average.

Grey literature reports

The searches returned grey literature reports exploring risk factors related to the COVID-19 pandemic on food insecurity. Loopstra (2020) used Food Foundation survey data commissioned from YouGov, which ran from 7-9th April 2020, to examine COVID-19-related risk factors for food insecurity in relation to measures of food insecurity, as well as to identify socio-demographic characteristics associated with the highest risks at that time. A total of 4,343 adults were surveyed online across Great Britain, and selected questions from the USDA AFSSM were adapted and used to capture moderate and severe experiences of food insecurity. Adaptations included asking about non-financial reasons for compromised access to food, such as being unable to go out for food and the shortages of food supplies in shops. The report explored various factors hypothesised to contribute to rising food insecurity in the first weeks of the pandemic, including losses of household income and self-isolating at home. Further research using other waves of Food Foundation YouGov surveys was commissioned after this report to continue to track the impact of the pandemic on levels of food insecurity.

The Social Market Foundation commissioned a survey from Opinium to collect data on food insecurity in the UK during the pandemic in 2020 to counteract the time lag of official statistics from the UK government (Bhattacharya and Shepherd, 2020).The survey was modelled on the questions that form the government's official measure. These survey data were used to explore variables related to higher levels of food insecurity among households with children.

Between April and May 2021, Lea and Holloway (2021) conducted a pilot survey of people who accessed food support services in Hull to gain information and insight into food insecurity in the city during the COVID-19 pandemic.

6.2.2 Risk factors for food insecurity based on proxy measures

Peer-reviewed journal articles

Data from the Trussell Trust food bank use have been one of the most commonly used sources of data. They have provided measures of the number of times people have received food parcels from a Trussell Trust food bank. Member food banks collate these monthly and the data are put into a centralised data base. Initially, data were only available for the food bank where vouchers were redeemed. However, in later years, they have been provided to researchers with the postcode area of the household receiving the parcel. These cross-area longitudinal data have been used for cross-area analyses for relationships between rates of benefit sanctioning at the local authority level (Loopstra et al., 2018) and relationships between the roll-out of Universal Credit and food bank use (Reeves and Loopstra, 2021). More recently, Sosenko et al. (2022) expanded this area of work to examine a wider range of welfare reforms in relation to levels of Trussell Trust food parcel distribution, including the value of out-of-work benefits and the spare room subsidy, in addition to the roll-out of Universal Credit and benefit sanctions, again using cross-area models from levels of food bank use for 2011 to 2019. In addition to looking at policy-related drivers of food parcel distribution in the Trussell Trust network, the influence of area-level operational features of food banks and area-level socio-demographic characteristics have been explored in relation to food parcel distribution. The former have included examining relationships with food bank density, number of opening hours, and when food banks are open (Loopstra et al., 2019a, Reeves and Loopstra, 2021; Sosenko et al., 2022). The latter have included relationships with unemployment rates, proportion of people claiming income-replacement benefits, and proportion of people with disability (Loopstra et al., 2019a, Reeves and Loopstra, 2021, Sosenko et al., 2022).

Cross-area differences in food insecurity have also been used by gathering data on stakeholders' perceptions of food insecurity and relating these to area-level deprivation. As already mentioned, Benjamin Neelon et al. (2017) conducted a survey among nursery managers across England to gather their perception of food insecurity in their areas. These cross-area data were then mapped onto area-level deprivation profiles to explore whether the level of deprivation in the area where the nursery was located was associated with a higher odds of manager-perceived food insecurity.

Descriptive surveys of people using food banks have been conducted to describe the profile of food bank users. Contrasts in housing tenure among people using food banks in comparison to the general population have been examined (Clair et al., 2020), as have differences in the socio-economic profile of infrequent versus frequent food bank users (Garratt, 2017). Prayogo et al. (2017) conducted a parallel survey of people using advice services alongside a survey of food bank users and compared prevalence of experiences of benefit delays, benefit changes, low income, homelessness, financial strain and adverse life events in relation to likelihood of using a food bank and experiencing food insecurity.

MacLeod et al. (2019) identified people who had used a food bank in a survey of households living in 15 communities in Glasgow in 2015 and examined the likelihood of food bank use in relation to socio-demographic characteristics already highlighted. In addition, they examined associations between food bank use and characteristics such as citizenship status, tenure, and a range of life events, including job loss, serious health events, bereavements, moving home, relationship break-up, being a victim of crime, mental health problems, and welfare reforms, including those relating to the under-occupancy deduction ("bedroom tax") sanctions, and change to other specific types of benefits.

Grey literature reports

The searches returned several reports published on the Trussell Trust website of research relating to risk factors for food bank use. Over October to December 2016, Loopstra and Lalor (2017) conducted a survey with 413 people receiving emergency food assistance from the Trussell Trust food bank network, to better understand the profile of people receiving emergency food support.

The Trussell Trust have published several reports on Universal Credit and food bank use. For research looking at the impact of Universal Credit roll out on food bank use, the Trussell Trust analysed food bank statistics (comparing the year 2015/2016 and 2016/2017), conducted a survey of food banks in the network and carried out in-depth interviews with food bank managers (The Trussell Trust, 2017). The Trussell Trust also ran a survey between February and March 2018 with 248 people who were referred to food banks in the network to ask about their experiences of Universal Credit (Jitendra et al., 2018). In 2019 Trussell Trust published research on the impact of the five week wait for a first Universal Credit payment. This research involved 70 qualitative case studies, analysis of Trussell Trust food bank data and data from The Riverside Group on rent arrears as well as data from parliamentary questions on Advance Payments, deductions, overpayments and arrears (Thompson et al., 2019).

Research projects funded by national funding bodies

A King's College London studentship is looking at how recent policy changes in the UK welfare system influence the mental health of individuals and families experiencing food insecurity, and how this is linked to the increasing use of food banks in the UK. The project will use quantitative data to examine relationships with welfare reform and life histories; it may also involve in-depth interviews with food bank users and policymakers (PI: Kousta; funded in 2020).

6.2.3 Risk factors for food insecurity using qualitative methods

In addition to quantitative analyses, qualitative studies have been used to explore the different events and hardships that have led people to experience food insecurity and/or receive help from food banks. In most cases, participants in these studies have been recruited from food banks rather than being recruited from the general public.

Peer-reviewed journal articles

Wainwright et al. (2018) conducted interviews among 25 people receiving help from three Trussell Trust food banks in Bristol. They asked questions intended to explore why people use food banks, and the differences people experience between food banks and statutory services. On the former, as well as probing for the acute reasons people were receiving help from food banks, they explored longer term experiences of unemployment, benefit receipt, low-paid work, and the recurrence of income crises. Beacom et al. (2021d) used qualitative and nominal group techniques to explore perspectives on drivers of food insecurity among stakeholders in Northern Ireland, examining the extent to which these aligned with individual, structural or political theoretical perspectives.

Other qualitative studies have also described reasons for food bank use among recipients of food aid and among food bank managers and volunteers. However, as these observations are often embedded in studies of how food banks operate and interactions between recipients of food aid and food aid providers, we have placed this literature in the section on responses to food insecurity (Section 6.5).

Government reports

In July 2020, FSA commissioned research to understand the impact of COVID-19 on food insecurity which involved 20 exploratory interviews with people experiencing food insecurity, followed by 6 follow up case study interviews (Connors, 2020). The research sought to

understand how people were experiencing and navigating food insecurity under COVID-19 and if and how people were accessing support.

Grey literature reports

Researchers at the Trussell Trust undertook participatory research between August 2021 and January 2022 with 48 individuals exploring the role of government debt in relation to food bank use as well as other the systems that can contribute to needing to use a food bank and also "policy solutions with and alongside people who have lived experience of poverty" (Bennett-Clemmow, 2022).

In 2017, Child Poverty Action Group (CPAG) and the Trussell Trust published a report examining reasons for food bank use and progress towards reducing food bank use (Haddad et al., 2017). This was an updated report to an earlier report from 2014, which was one of the first research studies into food bank use (Perry et al. 2014), which aimed to understand the need for food banks in the UK. It used mixed-methods, including in-depth and follow-up interviews with people using food banks, analysing administrative data from food banks and caseload analysis from a CPAG welfare advice service at a London food bank.

Qualitative methods were also used to explore risks for food insecurity over the COVID-19 pandemic. Research in Scotland involved interviews with representatives of organisations providing support to four groups in Scotland (the homeless, young carers and young adult carers, (destitute) asylum seekers, and people with disabilities) to understand the impact of the COVID-19 pandemic on food insecurity amongst these groups (Dempsey and Pautz, 2021). The "Food Vulnerability during COVID-19" project, led by Lambie-Mumford and Loopstra, explored stakeholders' views on risks to food insecurity during the pandemic. Workshops were conducted online over summer 2020 to spring 2021 and included participants from UK Government and devolved government departments and national charities, as well as local government public sector workers and local charities from eight case study areas (Lambie-Mumford, Gordon and Loopstra, 2020; Lambie-Mumford et al., 2020).

Research projects funded by national funding bodies

The searches returned two projects currently underway on the relationship between food insecurity and work, including a British Academy small grant looking at food insecurity dynamics in community and work contexts (no further methodology details provided) (PI: Colas; funded in 2022). A UCL doctoral fellowship is looking at in-work food insecurity, exploring the question of how in-work food insecurity in the UK is socially constructed through private and public discourse, practice and praxis (PI: Casu; funded in 2022).

6.2.4 Risk factors identified in cross-country studies

The UK has been represented in cross-country datasets that have included measures of food insecurity and food affordability, enabling analyses of macro-level drivers of food insecurity to be examined at the country level and also multi-level analyses of food insecurity, where individual and country-level drivers are examined in relation to individual-level risk. Whilst these cross-country studies do not describe effect sizes for the UK specifically, they offer insights into cross-country differences in prevalence of food insecurity and suggest possible policy and macro-economic drivers of these. As longer time series are developed, these data will continue to be an important resource for understanding the UK's levels of food insecurity in comparison to countries with similar levels of wealth and development.

Peer-reviewed journal articles

Loopstra, Reeves and Stuckler (2017) used data from 21 countries across Europe, including the UK, over 2004 to 2012 from EuroStat and the Organisation for Economic Co-operation and

Development (OECD) to examine the country-level relationship between food prices, wage levels and reported inability to afford to eat meat, chicken, fish or a vegetarian equivalent every second day. Here, they were interested in understanding if a growing gap between food price inflation and wage inflation was associated with rising levels of county-level prevalence in the population reporting not being able to afford food.

Another data set that has been drawn on for cross-country comparative work is the Gallup World Poll dataset. This data set includes minimum of 1000 respondents from over 140 countries each year who complete a questionnaire either by telephone or face-to-face interview. From 2014, it has included the Food and Agriculture Organisation (FAO)'s Food Insecurity Experience Scale. These data have been used to examine relationships between food insecurity and self-reported health outcomes and different drivers, examining whether these are consistent across indicators of countries' wealth and development. The influence of different policy contexts have also been explored, with wage setting policies (Reeves et al., 2021b) and the impacts of child income transfers explored (Reeves et al., 2021a). Barlow, Loopstra and Reeves (2020) used multi-level models to explore relationships between trade liberalisation and food insecurity with the FAO data. Dasgupta & Robinson (2022) used aggregated food insecurity data from 83 countries from FAO over 6 years and combined these with data on mean annual temperature. They explored if there was higher prevalence of food insecurity where countries experienced an anomaly in their average temperature in comparison to the mean over the past 30 years.

We also identified one study that used a commercial online consumer panel from Research Now, a market research company, to explore food insecurity in a survey of adults born before 1950 and living in either Germany, the UK or the Netherlands (Loibl et al., 2022). All respondents were screened to include only those who indicated some financial hardship in the past 5 years. The study focused on understanding socio-economic characteristics and financial stressors in relation to food insecurity, as measured by the USDA Adult Food Security Module, and differences in these relationships across different country contexts.

Acton et al. (2022) used self-reported data on food purchasing, consumption behaviours, food security and changes in overall diet healthfulness from another wave of the International Food Policy Study conducted in late 2020 to examine the perceived impacts of COVID-19 on dietary changes and food insecurity between the five countries included in the study (UK, Canada, US, Mexico and Australia). The food security indicator asked respondents if the COVID-19 pandemic affected whether households had enough food to eat. Differences in prevalence were compared between countries, as were the socio-economic characteristics associated with food insecurity during the pandemic, among other dietary outcomes.

6.3 Research focused on experiences of specific sub-groups in the UK population

Summary

Families with children, children and young people have been the focus of academic and third sector research. These have included case study research with children, surveys of families with children and a report on the Children's Future Food Inquiry. Research on food insecurity amongst disabled people and people with long-term health conditions has included the Scottish Government's analysis of Scottish Health Survey data and Trussell Trust research on disability, health and food bank use.

Experiences of benefit claimants have been explored through surveys including one commissioned by Trussell Trust of people claiming Universal Credit. Risks of food insecurity amongst low-income women in work has also been explored through analysis of Labour Force Survey data and interviews in the Sheffield City Region. The experiences of older people have

been explored through qualitative research involving interviews, visual methods, ‘go-along’ tours and other ethnographic approaches. Minoritised ethnic groups have also been the focus of research, including work exploring the experiences of UK white British and Pakistani women in Bradford and undocumented migrants in Birmingham.

6.3.1 Children and young people

Grey literature reports

An important focus of research has been the experiences of children and young people. Research conducted by O’Connell et al. and published by CPAG (O’Connell et al., 2019) on children and food in low-income families was based on in-depth case study research with 51 children from 45 families in two areas of South East England. It focused on the experiences of food by these children in various settings. Families were recruited via a short self-completion questionnaire sent to schools in the area and local charities. Semi-structured interviews were then conducted, followed by twelve families carrying out tours of their food preparation and storage areas. The study also focused on how children experienced free school meals.

Our searches returned a CentrePoint fact sheet (Cretch, 2022) on the impact of food insecurity on vulnerable young people, which cites data from a national representative survey of young people, but doesn’t provide detail of the methodology.

The Food Foundation’s publication, Children’s Right2Food, drew on data on food insecurity among children from the Survey of Londoners and data collected through the Children’s Future Food Inquiry research on children’s food insecurity (The Food Foundation, 2020). The Survey of Londoners was conducted in 2018/19 and interviewed adults aged 16 and over. Five questions were used to assess adults’ food security and seven questions to assess food insecurity among children (by asking parents in the survey). They compared levels of food insecurity for parents and children and drew from their engagement with children and youth to develop key action points for Government.

Ahead of the Children’s Future Food Enquiry in May 2019, a pack titled The Children’s Future Food Inquiry was put together (Finlay, 2019). In this briefing, a background to the report and its conclusions as well as the relevant Government policies were outlined. The Children’s Future Food Inquiry was coordinated by the Food Foundation think tank and led by the All-Party Parliamentary Groups on School Food, and Hunger and Food Poverty. The aim of the report was to “systematically talk to children living in poverty and seek their views” on “the food situation of children living in poverty across the UK”. Evidence was collected via workshops with nearly 400 children, an academic review of child food insecurity, polling of young people, evidence submissions from people working with children, a UK-wide policy review and secondary analysis of Government data on the affordability of a healthy diet.

Research projects funded by national funding bodies

Doctoral research at the University of Liverpool is examining the social determinants of food insecurity and its nutritional impact amongst women and children in the North East of England through qualitative research methods using ethnography and longitudinal qualitative interviewing, observations from inside food banks, focus groups with staff and semi-structured interviews with pregnant women and mothers of children under two years (PI: Bell; funded in 2018).

6.3.2 People with disabilities and/or long-term health conditions

Government reports

Drawing on Scottish Health Survey data, a Scottish Government analysis into outcomes for disabled people in Scotland noted that there is a higher prevalence of food insecurity among disabled adults and children (Scottish Government, 2019).

Grey literature reports

In 2018 the Trussell Trust published research on disability, health and food bank use (Hadfield-Spoor, 2018). This research aimed to understand more about people who were referred to food banks with disabilities and health conditions, how food banks were supporting them and what could be done to reduce the numbers of people with disabilities and health conditions needing a food bank referral. The methods included telephone interviews with 9 food bank managers, an initial survey which received 80 responses from food bank managers, and an additional survey with extra questions to gain further information from the food bank network. The research also involved food bank volunteers speaking with 119 people with a disability or health condition, but the methodology does not make clear what this involved.

6.3.3 Benefit claimants

Grey literature reports

The experiences of people claiming benefits, particularly those in receipt of Universal Credit, have been the focus of research studies. In February 2021, the Trussell Trust published a report based on a YouGov survey of 1,000 people claiming Universal Credit between 19th-25th January 2021 to examine the impact of the £20 uplift to Universal Credit that was put in place during COVID-19 (Weekes et al., 2021). Food insecurity among benefit claimants during the COVID-19 pandemic was also the focus of a report by Geiger et al. (2021). This was based on YouGov surveys of the general public (2,600 respondents) and claimants (6,300 respondents) to measure levels of food insecurity among these samples and explore why these groups might be at higher risk. The Trussell Trust have published research on the impact of the cost of living crisis on people claiming Universal Credit. This was based on a survey of 1,506 adults claiming Universal Credit, conducted between 24 January and 15 February 2022 which asked questions about how well people were keeping up with bills and credit commitments, if they were able to afford different kinds of essentials and if they had used a food bank since 1st December 2021 (Weal, 2022).

6.3.4 Research focused on experiences among women

Peer-reviewed journal articles

A pre-pandemic study investigated food bank use among low-income women workers through the lens of welfare changes (Beatty, 2021). Three key questions were asked: are working women resorting to food bank use in times of financial hardship?; to what extent is this a function of non-standard working practices?; and is welfare reform a contributing factor? The analysis involved data from the Labour Force Survey to understand pre- and post-recession trends in non-standard and precarious work which included involuntary part-time work, temporary work, zero-hour contracts and self-employment. Twenty interviews were carried out with stakeholders across three local authorities within Sheffield City Region (SCR) including managers and key workers at a range of local food banks, local support and referral agencies, and community organisations and service providers.

Research projects funded by national funding bodies

A UKRI doctoral research project at the University of Liverpool is examining how people, with a particular focus on women, have responded to and managed in the face of economic hardship and examining different community-based infrastructures that have been developing (no detail on methodology) (PI: Slocombe; funded in 2019). ESRC doctoral research at Newcastle University is

exploring women's experiences of food insecurity in Walker, Newcastle-upon-Tyne, through observational research methods at food banks and research with food bank providers (details not given) (PI: Jackson; funded in 2022).

6.3.5 Older people

Peer-reviewed journal articles

A 2017 study investigated the food vulnerability of older, bereaved men in the North of England (Thompson, 2017). The researchers carried out twenty-five face-to-face interviews that lasted up to 90 minutes with males over 65 years old. These interviews were left unstructured to allow individual narratives to emerge. An interpretative thematic approach to analysis was used. The individuals in this study were financially solvent and retired from professional and managerial roles.

An empirical study using a multi-method ethnographic approach aimed to explore how vulnerability to food insecurity affects everyday food practices in later life (Dickinson, 2021). These findings were then used to develop a model for national and local policymakers to establish where interventions could be targeted. Researchers carried out twenty-five tours with participants who were between 60 to 94 years old and living in the East of England. Participants showed researchers areas of their homes they associated with food. These included the kitchen, involving exploring the cupboards, fridges and freezers, and included gardens, allotments or sheds if people grew their own food. The researchers conducted semi-structured interviews and captured photographs and videos. "Go-along" tours were also carried out to explore places of food acquisition outside of the home.

A qualitative study published in 2021 explored the experiences of older adults during the first COVID-19 UK lockdown (Brown and Reid, 2021). There were three strands of questioning in this study: reactions to public health messaging, staying food secure and drawing on social capital within their community. Eight semi-structured telephone interviews were conducted and twenty-five participants completed a qualitative open-ended survey. A thematic analysis was undertaken to identify themes.

6.3.6 Minoritised ethnic groups

Peer-reviewed journal articles

In 2018 research was published that investigated the experiences of food insecurity amongst UK white British and Pakistani women (Power et al., 2018). As Pakistani women are less likely to use food banks than white British women, this study aimed to understand the lived experience of food amongst these groups in Bradford, England, including the use and non-use of food aid and reliance on social and familial support. Three focus groups and one interview was carried out with the support of a professional interpreter. This allowed women who only spoke Urdu or bilingual women to participate in the study. Recruitment was carried out in pre-existing community groups. In total, 16 women were interviewed.

In 2022, a survey was conducted to examine the risk of food insecurity among undocumented migrant households in Birmingham, UK (Jolly and Thompson, 2022). The researchers utilised a cross-sectional survey of households with dependent children using the USDA HFSSM. All participants had an irregular immigration status and were accessing an immigration advice drop-in service. Seventy-four households in total were surveyed. Comparisons in prevalence were made for different socio-demographic characteristics and to national level data on food insecurity.

6.3.7 Research funded by national funding bodies focused on population sub-groups

British Academy funded research looked at how vulnerable adults manage their food insecurity focusing on Birmingham and Salford, examining the help offered and the additional types of support needed (PI: McEachern; funded in 2019). The UKRI Transforming UK Food Systems SPF, through the Biotechnology and Biological Sciences Research Council (BBSRC), has funded a number of research projects that focus on disadvantaged communities. The FoodSEqual project is focusing on disadvantaged communities in Whitley-Reading, Brighton and Hove, Tower Hamlets, and Plymouth to explore food access for disadvantaged communities and how to improve affordable access to fresher and healthier foods (PI: Wagstaff; funded in 2021). The research project FIO-FOOD aims to develop practical solutions to promote sustainable and healthier food choices amongst people living with obesity and food insecurity (PI: Johnstone; funded in 2022). The research will be mixed-method, including the use of large scale data from retailers, stakeholder engagement and working with people living with obesity and food insecurity.

6.4 Outcomes associated with food insecurity

Summary

Only a few studies on the **food safety implications** of food insecurity in the UK context were identified. The existing evidence on food safety in relation to food security was primarily by, or commissioned by, the FSA including analyses of data from the Consumer Insights Tracker and Public interests, needs and concerns around food across the UK, Food and You 2 and qualitative research commissioned into food safety in community food provision.

Research on **dietary and health outcomes** of food insecurity included an analysis of Food and You (Wave 4) looking at fruit and vegetable intake and mental health and an analysis of a sub-cohort of mothers involved in the Born in Bradford birth cohort study looking at self-rated health. Surveys of adults recruited through convenience sampling approaches have also been used to collect data on food insecurity and dietary outcomes and food habits. Surveys have been conducted with food bank users to explore diet, weight and health. Health and diet outcomes for particular populations have also been explored including the impact of food insecurity during summer school holiday months on parental stress and the relationship between food insecurity and diet in adults with primary school-aged children. Cross-country research has been undertaken using Gallup World Poll data looking at health outcomes.

6.4.1 Food safety-related outcomes in relation to measures of food insecurity

Our evidence review found limited evidence on the food safety implications of food insecurity in the UK context. The existing evidence on food safety in relation to food security is primarily by, or commissioned by, the FSA.

Government reports

The FSA reports findings from the Consumer Insights Tracker survey monthly, which measures consumer attitudes, behaviours, and concerns related to food in England, Wales and Northern Ireland (FSA, 2022). Reports on the data from the tracker explore household food insecurity, consumer perceptions of food availability, consumer concerns in relation to food, consumer confidence in the food supply chain and the FSA (e.g. King and Heard, 2022).

Researchers from Bright Harbour were commissioned by the FSA and FSS to gather qualitative and quantitative evidence on public interests, needs and concerns around food across the UK

(Connors, 2022). They took a mixed methods approach utilising qualitative research with 94 participants, input from a "People's Voice Board" and academic input plus quantitative research through a nationally representative survey of 6175 UK respondents. The four key themes identified and explored in this research were (1) concerns about equitable, affordable access to safe, healthy food; (2) public trust in the current UK food safety, hygiene and standards; (3) guidance on fair, ethical and sustainable food systems and futures; (4) how it can be made easier to access and choose healthy, nutritious food. The researchers examined whether respondents' concerns about food safety differed between food secure and food insecure participants using a bespoke measure of food insecurity, adapted from the USDA measure.

The aforementioned Food and You 2 biannual survey measures self-reported consumers' knowledge, attitudes and behaviours related to food safety and other food issues, alongside food insecurity (Armstrong et al., 2022). The findings from each wave of this survey are reported on, including eight sections on the topics of 'Food you can trust', 'Concerns about food', 'Food security, 'Eating out and takeaways', 'Food allergies, intolerances, and other hypersensitivities', 'Eating at home', 'Food shopping: sustainability and environmental impact' and 'Sustainable diets, meat alternatives and genetic technologies'. This report is primarily descriptive and does not test associations between food insecurity and food safety.

Research projects funded by national funding bodies

Doctoral research at the University of Leeds is examining children's experiences of holiday hunger, and the effects it has upon their subjective wellbeing (details on the methodology not given) (PI: Mansfield; funded in 2018).

6.4.2 Diet- and health-related outcomes in relation to measures of food insecurity

In other high-income countries, such as Canada and the United States, food insecurity measures have regularly been included on health and nutrition surveys, and more recently, household surveys have been linked to medical record databases. These data sources have produced a large body of research exploring the links between food insecurity and a range of health outcomes in these country contexts. In the UK, food insecurity, as measured by a validated survey instrument, has not routinely been included on health or nutrition surveys, nor have survey data been linked to primary care data. Importantly, however, though the Food and You surveys are not primarily aimed at collecting data on nutritional intakes or health, they do include measures of self-rated health and intakes of some food groups. In Scotland, the Scottish Health Survey, has included some items from the FAO's FIES alongside a range of health measures, however, we did not identify any published papers that have examined links between food insecurity and self-reported health measures.

Peer-reviewed journal articles

Turnbull et al. (2021) used data from Wave 4 of the Food and You Survey to examine the relationship between food insecurity and reported frequency of intake of raw fruit, raw vegetables and cooked vegetables, after accounting for other socio-demographic variables.

Otherwise, researchers have used cohort studies and convenience samples to gather survey data on food insecurity and dietary outcomes and food habits. Shinwell et al. (2022) used a Prolific survey of low-income adults to target food secure and food insecure adults to take part in a smaller-scale diet survey. They used online 24-hour dietary intake software (Intake24) to collect 4-day diet records. These data were used to examine amounts of macro and micronutrients consumed, variability of foods consumed during a "consumption event" and time between them within a given day, and then variation in these outcomes between days. They also examined BMI as an outcome variable. Multivariate models accounting for income and sex were used, though a

matched sampling approach also minimised differences between food secure and food insecure participants.

Three analyses have been conducted using data from a subset of about 1200 mothers and their children participating in the Born in Bradford birth cohort study. Power et al. (2018b) examined how food insecurity, measured when children were 12-18 months of age, was associated with self-rated health at four time points post-birth up to 30 months. They used logistic regression models to examine the odds of fair/poor health between those who experienced food insecurity and those who did not. They also examined differences in these relationships between White British and Pakistani women. Using data from the same cohort but also linked to primary care records, the same authors also examined whether food insecurity was associated with incidence of common mental disorders (Power et al., 2017). Lastly, data from the same cohort of mothers and children were also used to examine food insecurity in relation to data on child's dietary intake measured through a food frequency questionnaire at 12 months of age, mothers' dietary intakes at 18 months post-partum, and weight and height data for both mothers and children collected at 12 month intervals post-partum and again among children when they were 4-5 years of age. They also examined whether these associations differed between White British and Pakistani women.

The relationship between food insecurity and body weight was also examined in a survey of just over 200 adults recruited through social media in summer 2020 following the first COVID-19 lockdown (Keenan, 2022). An adapted version of the USDA Adult Food Security Module was used to capture insecure and insufficient food access arising from food shortages in shops or an inability to go out during the pandemic, in addition to financial reasons. Outcome measures explored included depression measured by the Depression, Anxiety and Stress Scale, physical symptoms of stress, motivations for eating measured by the Palatable Eating Motives Scale, motivations for drinking measured by the Drinking Motives scale, diet quality as assessed by a 20-item food frequency questionnaire, and questions assessing changes in eating behaviours that might be weight promoting. The primary aim of this study was to explore if food insecurity was indirectly associated with changes in eating behaviours through associations with distress and maladaptive coping behaviours.

Some of the same authors were also involved in another study that aimed to examine relationships between food insecurity, physical stress, psychological distress, maladaptive coping behaviours, dietary quality and BMI, among adults recruited from food banks and online (Keenan, 2021). They again used structural equation models to examine the extent to which distress and maladaptive food-related coping behaviours mediated relationships between food insecurity and BMI.

Stretesky et al. (2020) conducted a survey of 252 parents in the North-East of England whose children had participated in a local authority run or funded summer holiday activity to examine the relationship between experiences of food insecurity during the summer school holiday months and parental stress. The latter was measured by the Impact of Event Scale, which includes 15 questions that capture the subjective stress that people experience following a serious life event. The school summer holiday period was the event of interest in this case. A subset of questions from the USDA Household Food Security Module was used to measure food insecurity, with the recall period specified as the summer holidays. In addition, the authors examined the extent to which economic hardship (unemployment and/or low income) with parental stress during school holidays was mediated by food insecurity.

A mixed methods study which involved a survey of adults with primary school-aged children distributed through primary schools and social media in York also examined relationships between food insecurity and diet (Power et al., 2021). The 2-item food insecurity scale (adapted from the USDA Household Food Security Module) was used to measure food insecurity. Two questions related to diet: one asking about the frequency of fruit and vegetable consumption and a second asking how often respondents ate processed food or ready meals. Additionally,

respondents were asked if they had ever used a food bank. In addition to a survey, the researchers conducted a focus group with 22 low-income parents and carers to explore their experiences of food on a low income. The authors also analysed free-text responses to an open-ended question about food on the survey related to this theme.

We identified a couple of studies that have attempted to explore the mechanisms behind the relationship between food insecurity and weight using experiments. These have included lab experiments that look at acute effects of food insecurity on snack consumption (Godsell et al., 2019) and on taste preferences (Nettle, 2019), as well as how taste preferences were related to recall of childhood experiences of food insecurity.

Grey literature reports

In a paper self-published online by Blake & Cromwell (2022), bivariate relationships between food insecurity and self-reported health based on data from the FSA Food and You 2 survey were examined.

Co-produced research between IFAN and JRF (Pollard 2022) looked at the impact of poverty and food bank use on mental health. This qualitative research was conducted in two food banks (one in London and one in Kent) and involved 10 interviews with 13 people in total who were “broadly reflective of the cohort using the food banks”.

6.4.3 Diet and health-related outcomes in relation to proxy measures of food insecurity

Peer-reviewed journal articles

As discussed earlier, food bank use has often been used as a proxy for food insecurity but studies conducted among people using food banks have also been done to better understand their health needs. Loh et al. (2021) used data from a survey of 598 adults using Trussell Trust food banks across the UK merged with data from the Health Survey of England to explore differences in odds of poor self-rated health, disabilities, and/or metabolic, cardiovascular, musculoskeletal or mental chronic health conditions in the sample of food bank users compared to the general population. They examined whether these associations remained after accounting for differences in socio-economic status.

Barker et al. (2019) conducted an interviewer-administered survey to people attending three food banks located in a city in England (not specified). A total of 112 people participated. Diet recalls were used to collect data on dietary intakes in the 24 hours prior to food bank use. These data were then used to describe intakes of energy, macronutrients and selected micronutrients in the study population, which were then compared to dietary recommendations. BMI and presence of health conditions were also examined in the study sample.

6.4.4 Diet and health-related outcomes using cross-country datasets

Peer-reviewed journal articles

Our searches also returned studies examining the relationship between food insecurity and different health outcomes using data from the aforementioned Gallup World Poll. The UK was included in these analyses. These included examinations of mental health symptoms, well-being, and life satisfaction among adult respondents (Elgar, 2021a) and also among youth respondents (aged 15-24) (Elgar, 2021b).

Research projects funded by national funding bodies

Doctoral research on the impact of food insecurity on food-related cognition is currently being conducted at Newcastle University, exploring whether?food insecurity strengthens any aspects of food-related cognition. The project is informed by behavioural and psychological theories, but the summary does not explain research methods (PI: Neal; funded in 2020).

6.5 Implementation and impacts of interventions aimed at reducing food insecurity and/or improving food access

Summary

Survey data have been used to examine experiences of food insecurity in relation to receipt of free school meal replacements when schools were closed during the COVID-19 lockdowns. Cost/benefit analyses of increasing **free school meal** provision have been published, as has case study research designed to showcase best practices in school food provision. Desk-based research and data collection with stakeholders have been used to explore the roll-out of **universal infant free school meal provision** and survey research has looked at the uptake of school meals. Survey data has been used to explore the impact of the Universal Infant School meals policy on dietary intake.

Experiences of food insecurity during the **school holidays and the impact of holiday programmes** have been explored through quantitative and qualitative research, including evaluation of the HAF programme. This has included parent surveys and interviews, surveys with children and participatory and ethnographic research looking at motivations of volunteers. The impact of **breakfast club provision** on academic attainment has also been evaluated.

The **Healthy Start** programme has been the subject of peer reviewed research that has looked into fruit and vegetable intake, food purchase data and the impact of universal implementation. Qualitative studies with mothers, health professionals and other stakeholders have also explored Healthy Start uptake. The Scottish government have published an evaluation of the Best Starts Foods programme (an alternative to the Healthy Start voucher scheme provided in England).

Many peer-reviewed studies and grey literature reports have focused on the activities of **food banks and other forms of community food provision**, covering a range of research questions and using a range of methods. Research has looked at the different types of provision available (mapping that provision and assessing the nutritional value of the food provided), the role of food banks and food aid (how they operate, perspectives of providers and recipients). Several academic studies have also looked at the relationship between the growth of food banks and austerity policies.

The searches returned several **multi-component/multi actor strategies** and interventions, including local food poverty action plans and a Scottish Government evaluation of the range of support available for low-income households during the COVID-19 pandemic. One example of research looking at the role of **food companies** in responding to household food insecurity was identified.

6.5.1 Free school meals

Peer-reviewed journal articles

The closure of schools during the COVID-19 pandemic presented serious challenges for ensuring that children eligible for FSM would continue to receive these during the lockdown. In an early analysis of data from the first COVID-19 wave of the UKLHS Understanding Society conducted in April 2020, Parnham et al. (2020) examined the extent to which households eligible for FSM reported receiving a FSM voucher or cooked meal at school during the month of April and

variables associated with access. Additionally, they examined associations between receipt of FSM at that time and food insecurity measures, namely, food bank use and reports of being hungry in the past week.

Data from a survey conducted among a total of 2166 adults living with children and young people aged 7 to 17 years over August to September 2020 and again in January to February 2021 by ChildWise and commissioned by the Food Foundation was used to examine levels of food insecurity, receipt of FSM and mental health over the COVID-19 pandemic (Yang, 2022). The questionnaire included a section answered by one child in the adult's household. Analyses were carried out to test if children in receipt of FSM were more or less likely to be food insecure. Logistic regression models were used to examine relationships between food insecurity and mental health. An interaction between food insecurity and receipt of FSM was tested to examine if receipt altered the relationship between food insecurity and child mental health outcomes.

Included in McIntyre et al. (2022) aforementioned review of websites, news articles, government publications, policy documents and journals articles was information on how free school meal provision was delivered during the COVID-19 pandemic across England and each of the devolved nations. Similarities and differences in provision were examined. Similarly, the extent to which evidence was used to inform decisions about how FSM were delivered over the pandemic was examined through examinations of policy documents and application of the Evidence Transparency Framework (Parnham, 2022).

Grey literature reports

Impact on Urban Health commissioned PricewaterhouseCoopers to undertake an analysis of the societal and economic benefits of increasing free school meal provision in England in 2022 (Impact on Urban Health, 2022). They conducted a scoping and literature review, reviewed and developed the existing food and children's health Theory of Change, undertook a cost-benefit analysis and produced a final report. They analysed two scenarios: expanding free school meal provision for all state school pupils receiving Universal Credit and expanding free school meal provision for all children across all state-funded education. Their analysis drew on existing sources of data.

Case study research showcasing ten examples of work to encourage uptake of school meals in Scotland, published in 2021, looked at the role of FSM as an anti-poverty action in Scotland and aimed to identify and share good practice and learning around providing FSM (McKendrick and Cathcart 2021).

Research projects funded by national funding bodies

ESRC doctoral research at the London School of Economics and Political Science is examining the role of secondary state school governors in supporting children eligible for FSM in England through action research with governing bodies in 3 to 4 schools. The study is looking at how governors conceptualise food insecurity and understand their duties to promote children's health and wellbeing with regard to free school meal provision. The research will also examine the relationships between governors' perspectives on childhood food security, their statutory duties and the capabilities of children eligible for FSM to access and eat nutritious school meals and to learn (PI: Page; funded in 2022).

6.5.2 Universal (infant) free school meals

Peer-reviewed journal articles

Drawing on data from a review of websites, news articles, government publications, policy documents and journals articles, McIntyre et al. (2022) examined types of universal free school meal provision across each of the four UK nations over 2010 to 2022. Chambers et al. (2020)

examined the implementation of UFSM in Scotland using a qualitative case study approach and informed by Normalisation Process Theory. They collected data from school-level stakeholders shortly after implementation of the new Universal Free School Meal policy and in the following school year with school-level and local authority-level stakeholders.

Goodchild et al. (2017) conducted a cross-sectional survey among over 670 parents whose children were in key stage 1 classes and attended 19 participating schools in Leicester over October to November 2015 in order to assess how child and family socio-demographic characteristics, parental beliefs and school-based factors related to take-up of UFSM one year after they were introduced.

A quantitative examination of the impacts of Universal Infant Free School meals was carried by Parnham et al. (2022) using data from the National Diet and Nutrition Survey (NDNS). Owing to the relatively small sample size of the NDNS each year, data were pooled for the years prior to introduction (2010-2014) and post introduction (2014-2017). They used a difference-in-difference approach, comparing eligible schoolchildren (those 4-7 years) to junior schoolchildren (8-11 years) as controls and examining impacts on intake of food, namely, fruit and vegetable intake, sugar sweetened beverages, and crisps, as well as nutrient intakes. They also examined differences in effects by income group.

Research projects funded by national funding bodies

NIHR-funded research has been evaluating the provision of UFSM (UFSM) to secondary school-aged students in the London Borough of Hammersmith and Fulham local authority (PI: Campbell; funded in 2020). The research looks at a range of aspects including the feasibility of universal provision in the context of secondary schools, as well as the impact on children and family finances and food insecurity. It also looks at the barriers and enablers to effective implementation and whether this provision is a cost-effective approach to addressing student hunger.

6.5.3 Food provision during school holidays

Peer-reviewed journal articles

Before introduction of state-funded school holiday food and activity provision in the UK, research focused on understanding the current level of provision and feasibility of pilot programmes. For example, early research examined the extent of school holiday provision across England (Mann, 2018). The researchers distributed a survey through the membership base of the All-Party Parliamentary Groups on School Food and the Association of Public Service Excellence in order to obtain information on where school holiday provision was provided. These data were used to map locations of clubs, which were then examined in relation to area characteristics in order to understand whether holiday clubs were reaching the most disadvantaged areas of England. Holley, Mason and Haycraft (2019) conducted focus groups with leaders of sports holiday clubs that piloted the provision of free food for children in 2016 to examine opportunities and challenges related to offering food from the club. Staff perspectives were also explored in another study on the feeding practices used at holiday clubs (Bayes et al., 2022). Nine interviews and four focus groups were conducted over the 2019 summer holidays.

Qualitative and quantitative approaches have been used to examine the experiences of children during the school holidays and the impacts of school holiday programmes on their experiences and of their parents. Shinwell et al. (2021) used purposive sampling and qualitative interviews to explore the views of 65 primary and secondary school children attending holiday clubs in Northern Ireland. Long et al. (2018) conducted a survey of 38 parents of children attending holiday clubs to assess levels of food insecurity and the benefits they perceived from holiday clubs. Food insecurity experiences were also explored by Shinwell and Defeyter (2017) who used qualitative interviews to explore how parents whose children attended school holiday programmes

(n=21) described their food shopping habits and ways they fed their children over the school year and during the school holidays. They also reflected on the benefits of programmes providing free activities and food for children during the holidays. Denning (2020) used participatory and ethnographic methods to explore how religious faith played a role in motivating volunteers at one holiday lunch programme and in a second paper (Denning, 2021) how volunteering for a holiday feeding programme influenced the faith of volunteers involved.

Lastly, the COVID-19 pandemic resulted in the need for holiday clubs to make adaptations to their provision. Adaptations and challenges were studied by Bayes et al. (2021) through video interviews with 25 holiday club staff over August and September of 2020.

Government reports

The Department for Education commissioned a literature review to look at evidence related to 'holiday hunger', as part of their work on the HAF programme. In a published evaluation of breakfast club provision, no data are collected on household food insecurity, but teachers' perceptions around levels of hunger amongst pupils are noted. Based on school visits, the Office for Standards in Education, Children's Services and Skills (Ofsted) reports on 'food poverty' impacting on pupils in some schools as part of research on experiences of children and young people with Special Educational Needs.

The Welsh government have published findings of a 'holiday hunger' pilot, based on surveys with children and parents, which looked at the impact of food provision in the summer and October half term holidays in the academic year 2019-2020 (Welsh Government, 2020).

Grey literature reports

The searches also returned an impact report on Camden Holiday Hubs, drawing on monitoring data.

Research projects funded by national funding bodies

NIHR have funded an evaluation of Southwark Council's summer 2022 HAF Programme. The project involves research with coordinators and delivery partners, children and their parents or carers in order to understand the challenges that they face, and the benefits children and their families are gaining by being part of the programme (PI: Adamson; funded in 2022).

6.5.4 Breakfast Clubs

Peer-reviewed journal articles

Lambie-Mumford and Sims (2018) conducted a scoping review of breakfast programmes for children in the UK in order to better understand their aims, how they operate and evidence of their effectiveness. The scoping review included a literature review of academic literature, policy documents, and web content of national breakfast programme providers.

Grey literature reports

Crawford et al (2019) evaluated Magic Breakfast provision using a comparison groups design. The objectives of the evaluation were to measure the impact of breakfast club provision on academic attainment; and to explore the mechanisms through which provision of a breakfast club improve academic attainment and variation in effectiveness across subgroups of pupils. Schools were assigned to two groups; one received support to set up a breakfast club in the academic year 2014/2015 and the other received support to establish one in the following year. The data collected for the evaluation included administrative data and online and paper surveys of teachers, headteachers, and pupils.

6.5.5 Healthy Start/Best Start Foods programmes

Peer-reviewed journal articles

We identified five academic studies that have focused on the Healthy Start programme published since 2017. Scantlebury et al. (2018) used data from the Health Survey for England to examine trends in fruit and vegetable intake before and after the Healthy Start programme was introduced in 2006. They examined trends for one “treated” group (Healthy Start eligible families) and compared trends in fruit and vegetable consumption to three “control” groups: who met only the income, demographic (i.e families with children under 4 years) or no eligibility criterion. Parnham et al. (2021) also used quantitative data to try to assess the impacts of the Healthy Start scheme. They used data from the Living Costs and Food survey over 2010 to 2017. Expenditures on fruit and vegetables, infant formula, and/or total food purchases were compared between 4 groups: households eligible and participating in the scheme, those eligible but not participating, those near eligible and those ineligible. Griffith, von Hinke and Smith (2018) also examined food purchase data in their analysis of Healthy Start, this time longitudinal data from the Kantar Worldpanel. They examined whether household food purchases, fruit and vegetable purchases, and macro and micronutrient purchases changed with the introduction of the Healthy Start scheme, using a difference-in-difference approach. Others have used qualitative approaches to explore perceptions of mothers, health professionals and other stakeholders about Healthy Start vitamin and voucher take-up (Moonan et al., 2022; Ohly, 2019). Moonan et al. (2022) included a focus of comparing experiences where a targeted approach to vitamins was used compared to universal implementation in another area.

Government reports

An evaluation of the Scottish Government’s Best Start Foods programme (an alternative to the Healthy Start voucher scheme provided in England) was published by the Scottish Government in 2022. This evaluation drew on a number of data sources, including in-depth interviews with 33 recipients across Scotland, conducted between December 2021 and February 2022, official statistics from Social Security Scotland about approved applicants and data from the Social Security Scotland Client Survey (Director-General Communities, 2022).

6.5.6 Food banks and other community food support

Peer-reviewed journal articles

We identified many studies that have focused on the activities of food banks and other community food provision and activities. This was a diverse research base, which addressed a number of different research questions. Most of the data were qualitative and focused on specific local geographical areas where the research took place.

Research studies have explored a number of different community food initiatives. These have included public-sector led community food growing (Franklin, Kovach and Csurgo, 2017), food partnerships and community development initiatives (Farrier et al., 2019; Curry, 2022), and their relationships to local area policies, namely, Local Industrial Strategies of the English Local Enterprise Partnerships (Curry, 2021). Tonner et al. (2017) examined the adoption of social enterprise activities within community food initiatives.

Food banks and other forms of community food aid have been examined from many different angles. Numerous studies have examined and discussed the ways that food banks operate (Meads, 2017; Okeke-Ogbuafor & Gray, 2019; Iafrati, 2018; Denning, 2021; Cloke et al, 2017; Bruck & Garthwaite, 2020; Power et al, 2017) , the perspectives of managers and volunteers working in food banks and how they interact with the people who receive support from food banks (Power et al, 2020; Surman et al, 2021; Strong, 2022; Lee et al, 2021; Bowe et al., 2019) and

moral complexities of the charitable food system (Möller, 2021; May et al., 2019; Beck & Gwilym, 2020; Livingstone, 2017). These have predominantly used qualitative methods and been based in various local authorities across the UK. For example, Power et al. (2020) conducted focus groups and interviews with food insecurity service providers and separately, focus groups with White British and Pakistani women at risk of food insecurity in Bradford, to compare and contrast their conceptualisations and beliefs about need, food choices, food and household management skills, and causes of food insecurity. In an earlier study, they examined the religious identity of community food aid outlets in Bradford (Power et al, 2017).

Surman et al. (2021) used participant observations and an ethnographic approach to observe interactions between food bank volunteers and people receiving food from food banks across 19 food banks in the post-industrial heartland of the UK. They also used creative participatory methodologies and participant interviews. The study focused on role of compassion within food banks. Others have used interviews and ethnography to examine how foods offered at food banks are experienced (Strong, 2022) as well as quantitative analytical approaches to appraise the food provided (Fallaize et al., 2020).

One area of focus has been the relationship between the growth of food banks and austerity in Britain. Lambie-Mumford and Green (2017) explored relationships between state provision for children and rising use of food parcel distribution to children. May et al. (2019) explored the idea of the growing “shadow state”, exploring whether food banks (and third sector providers) were increasingly delivering welfare provision and the kinds of practices they adopt when doing so. In a second paper, May et al. (2020) examined the extent to which austerity, the scarcity narrative that accompanies it, influenced food bank operations. Beck and Gwilym (2022) explored whether an erosion of the UK welfare safety net can be linked to increasing usage and reliance on food banks.

Government reports

The Scottish Government has commissioned research which was conducted between June and September 2019 to provide a snapshot of where and how organisations were responding to food insecurity in Scotland. This research involved a survey of organisations to understand the location, type, frequency and accessibility of their food provision (Scottish Government, 2020).

The Welsh government has published research, based on an online survey with food banks, into the period poverty provisions made available in food banks (Welsh Government, 2018).

The FSA commissioned Ipsos MORI to conduct a qualitative research study exploring community food provision (Ipsos, 2022). This report aimed to understand how food safety is considered for people receiving community food provision and ensure that the food received is as safe as it should be, and to explore the FSA’s role within this. Firstly, a rapid evidence review was conducted to understand the scope of the project and establish an overview of the existing evidence on community food provision. A desk-based literature review was carried out as well as three qualitative interviews with representatives from third sector organisations involved with community food provision. Secondly, online qualitative research via eight case studies with community food providers from England, Wales and Northern Ireland was undertaken. The case study participants were from eight different organisations; some suggested to Ipsos by community food networks engaged in phase one and the rest identified via desk research. The case studies included at least one interview with a project manager or founder.

Grey literature reports

The searches highlighted one grey literature report which examined the nutritional value of food parcels distributed by food banks in the Trussell Trust food bank network (Hughes and Prayogo, 2018). The researchers looked at the parcel contents given out by five food banks in London and compared them to the nutritional requirements for adults over three days. Research from 2017 in

Scotland has looked at the ‘non-food provision’ of food banks in the network there, through a survey of food banks in the network in Scotland to find out demand for and provision of non-food items (The Trussell Trust, 2017b). 48 food banks responded to the survey (representing 92% of Scottish Trussell Trust food banks).

Wellstead et al (2019) draw on existing sources (data and webpages) to scope out where philanthropy can make a difference to addressing food poverty in the North East of England; the report sets out why the North East of England is particularly vulnerable to a rise in food poverty and ways in which philanthropic support can make a difference.

Research projects funded by national funding bodies

NIHR funded research in the North and South of England is looking at what approaches used by community food assets are most likely to help prevent the need for emergency food in two multi-cultural populations and use the research to inform local and national government as to how best to invest in these or other resources (PI: Bryant; funded in 2023). The methodology is primarily qualitative based on observation, ethnography and interviews. Another NIHR funded study involves a cluster randomised controlled trial of the benefits of a place and household-level subsidy for fresh fruit and vegetables on diet, health and the wider environment (PI: Relton; funded in 2020). The intervention involves a combination of financial measures (5 x £1 weekly vouchers), seasonal veg-based recipes, brief nutritional information and healthy eating messages.

British Academy small grant funding has been awarded to look at different models of food aid provision (details of methodology not found) (PI: Ranta; funded in 2022). Doctoral research funded by an ESRC CASE studentship at the University of Liverpool is working in collaboration with a local social enterprise Can Cook, to recommend an economically sustainable, scalable and community-centred response to food insecurity (PI: Taylor; funded in 2021).?The research involves evaluating the limitations of traditional food aid and drawing on the attitudes and experience of food insecure individuals to inform local social enterprise responses. UKRI R&D funding has been received to develop an app to enable people experiencing food insecurity to access donations of surplus food (PI: Fomson; funded in 2022). Post-doctoral research at the University of Sheffield will examine the structures, day-to-day practices, and motivations of third sector organisations working in low-income communities to support food insecure households (PI: Gordon; funded in 2022).

Doctoral research projects are also exploring sites of community support in more detail. One project at the University of Glasgow is exploring the politics of food banking, with a focus on theories of violence and specifically examining ‘the production, reproduction and contestation of the violent’ in food banks (PI: Kane; funded in 2019). Doctoral research at Queen Mary is exploring the role of friendship in enabling people to cope with food poverty, using individual and group interviews (PI: Kramer; funded in 2021).

6.5.7 Multi-component/multi-actor interventions/strategies

Government reports

The Scottish Government have published an evaluation of the impact of the range of support for low-income households during the COVID-19 pandemic, which included support with food access (Scottish Government, 2022). The research involved interviews with 60 participants from low-income groups, The Scottish Government have also published a report into support for people at higher risk of severe illness from COVID-19 (Director-General Health and Social Care, 2020). This involved a survey of 530 third sector organisations, which evaluated the extent to which they were supporting people in this group and how they were doing so.

Grey literature reports

The Hackney Food Poverty Action Plan was based on evidence collected through stakeholder outreach (informal one-to-one conversations and meetings), a stakeholder survey with 42 responses (covering their understanding of the drivers of food poverty, the services they provide and who they work with), 6 in-depth stakeholder interviews and 10 in-depth interviews with local people who have lived experience of 'being hungry' (Hackney Food Justice Alliance 2018). The Islington Food Poverty Action Plan similarly uses existing data research and data on local rates of food poverty and food insecurity, and supplements this with interviews with residents and professionals (Islington Food Poverty Alliance, 2019). The Lambeth Food Poverty and Insecurity Action Plan 2021-2024 also drew on existing data from Sustain (Lambeth Together, 2021). Newham London (2021) have a Young People and Food Security strategy that also drew on existing data and publications (Trussell Trust food banks statistics, Indices of Multiple Deprivation).

Sustain: the alliance for better food and farming have surveyed London Councils on the action they have taken on food poverty. The report also cites existing data from Trussell Trust, IFAN and the Local Government Association (Sustain, 2022).

Research projects funded by national funding bodies

Another doctoral research project, based at Imperial College London, is exploring a community-based system dynamics approach to understanding and addressing food insecurity in Westminster Council (details on research question and methodology not given) (PI: Bilanji; funded in 2022).

6.5.8 Private sector responses

Grey literature reports

Kennedy and Snell (2021) conducted a programme of knowledge exchange work with a supermarket partner to better understand what activity they were undertaking in relation to food insecurity (their goals and programmes). This project also involved a literature review, workshop with food charity practitioners and a webinar.

Research projects funded by national funding bodies

Research funded by the Leverhulme Trust is exploring the relationships between large UK food companies and food charities. The research aims to come to a better understanding of the scale and nature of the involvement of food companies in charitable food provision and explore the implications of these relationships for food charity systems (PI: Lambie-Mumford; funded in 2023).

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Household food insecurity in the UK: 7. Discussion

Our searches identified a range of research and reporting on household food insecurity related to the themes explored for this review. There are now a variety of data and analyses of different measures of household food insecurity, enabling descriptions of the prevalence of the problem across the UK and estimates of levels of risk in local areas. Research on risk factors for food insecurity has explored the impact of socio-economic and demographic factors as well as policy drivers including social security. Experiences of household food insecurity amongst families with children has been the focus of increasing amounts of research in recent years, as have the experiences of older adults and those living with health conditions and disabilities. Research on potential outcomes of household food insecurity covered dietary and health outcomes, with very little research returned on food safety outcomes. Research on responses to household food insecurity has looked at the impact of free school meals, breakfast and holiday clubs, Healthy Start and Best Starts programmes, multi-stakeholder policy approaches and community food provision, although rarely in relation to validated survey measures of household food insecurity. In this discussion section we reflect on what we see as some of the key gaps in the existing evidence landscape.

7.1 Research on definitions, concepts and measurement of household food insecurity

The use of different survey instruments to measure food insecurity, as well as different recall periods and use of different survey methods, mean that there are now many sources of data on food insecurity in the UK that may appear inconsistent with one another when reporting on scale of the problem. There are strengths and weaknesses to the different methods in use and so it is important that these are recognised when the data are reported. An acknowledgement of these differences will help in the reporting, as else, inconsistency in the figures reported may be interpreted as unreliable data.

Importantly, there are benefits to different government departments and third sector organisations engaging in collection of data on food insecurity because they allow us to learn different things. For example, the Food Foundation's Food Insecurity Tracker and FSA's Consumer Insights Tracker both allow for timely data on food insecurity to be released, allowing for insight into within-year fluctuations in levels of food insecurity. However, these data sources do not include the full AFSSM and are based on data from relatively small population samples collected from online survey. In contrast, data from the FRS are not released until about 12 months after the end of the year-long fieldwork period. Yet, the sampling methodology used in this survey likely results in better coverage of the population, and the sample size of households participating in this survey is much larger (about 19,000 households including about 32,000 adults). The FSA's Food and You 2 survey has a sample size of around 4,500 households (and about 6,700 adults), recruited using a probabilistic sampling approach. In addition to the full AFSSM, it includes a range of food-related questions that are not included in the FRS, allowing for exploration of different topics in relation to food insecurity. But there is also some delay between the fieldwork period and when results are reported. For example, Wave 5 data were collected between 26 April and 24 July 2022 and published in March 2023.

To aid in interpretation of the survey data on food insecurity, a comparison of the different measures in use across all nations of the UK would be beneficial. This could be complemented by research on the agreement and discrepancies between different survey instruments. The FSA's work on wider issues around food insecurity (Connors et al., 2022) could also be built upon to explore manifestations of food insecurity that may not be captured by the validated survey modules currently used in the UK (i.e. the USDA AFSSM).

The use of household surveys to obtain estimates of food insecurity in local areas is also relatively rare. Instead, proxy measures are often used or indices of local level risk have also

been developed. There is a need for research that examines the validity of indices and proxy measures in relation to local survey-based measures of food insecurity.

7.2 Drivers of individual/household level access to food

We identified relatively few analyses of the quantitative data on food insecurity that are available, especially from the FRS. There is a need for more multivariate analyses of a wider variety of risk factors for food insecurity to move towards greater understanding of the potential causal drivers of food insecurity. For example, we did not identify any general population studies exploring relationships between housing costs and food insecurity, debt and food insecurity, and different elements of the benefit system in relation to food insecurity, though these have been examined in relation to food bank use and among benefit claimants specifically. Also, of the studies we identified on this theme, almost all were from academia or third sector organisations, with almost none from Government.

Whilst there are now large datasets that include survey measures of food insecurity, many of these datasets are still not large enough to understand risks of small subgroups in population. This results in crude classification of socio-cultural-ethnic groups. This limits what can be learned from sub-group analyses. Targeted sampling or over-sampling of some groups who are underrepresented in household surveys would be beneficial for understanding risks in smaller subgroups in the population, such as those highlighted below. There is also a need for intersectional approaches to research in this area, both quantitative and qualitative. Some underexplored risk factors for food insecurity include age, ethnicity, immigration status, and gender differences, and how these intersect with one another.

We also identified only a few studies that have used mediation approaches to try to understand whether poverty mediates the risk of food insecurity observed for some sub-groups in the population. More of these, with clearer conceptual frameworks, would be beneficial for understanding the relationship between socio-demographic characteristics, food insecurity and measures of poverty and deprivation.

7.3 Experiences of different population groups

We need more nuanced analyses to understand experiences of different cultures and communities in relation to food insecurity. In particular, as above, there needs to be a focus on intersections with other characteristics, for example: food practices and cultures, disadvantaged communities, health, and language barriers. Analyses of risks of household food insecurity also show that life-limiting health problems or disabilities that limit every day activities are significantly associated with severe food insecurity, so more research is needed into the dynamics of this relationship and individual experiences. Other groups at significant risk of severe food insecurity, where more research on their experiences would be beneficial, are those experiencing unemployment, and those living in the lowest income quartile. Younger adults (16-24 and 24-34 years) and those with low levels of education are also at higher risk of any level of food insecurity, so more research is needed on these relationships. Research is also needed on the experiences of groups who wouldn’t be captured by household surveys, for example those who are homeless, or temporarily housed. Students living away from home may be another subgroup of interest, as research from North America has suggested high levels of food insecurity among university students and unique drivers for food insecurity in this population (Bruening etal., 2017).

7.4 Outcomes associated with food insecurity

Research into the outcomes of household food insecurity appears to be an emerging area. Much of the research identified was published in the last three years and involves quantitative research

looking at health and dietary consumption. However, there remains a need for better measures of diet and health outcomes on surveys that also measure food insecurity. There is relatively little qualitative work on diet and health outcomes. The lack of longitudinal data is notable here, and this is needed to better understand the temporal relationship between food insecurity and different outcomes.

Our searches didn't reveal any research examining social outcomes, educational achievements, child developmental outcomes, or child and youth mental health. Whilst FSA commissioned research has looked at some aspects of food safety (food safety in community food providers' practice and in practices designed to make food go further), there is a lot of scope in this area for more research.

7.5 Interventions aimed at reducing food insecurity and/or improving food access

Whilst there is research on free school meals and the Healthy Start programme that are focused on implementation, take-up, and nutritional outcomes, none so far have evaluated the impact on household food insecurity specifically. There were important examples of econometric approaches to evaluating Healthy Start and UFSM but more of these types of analyses are needed in relation to food insecurity measures to understand how policy changes influence insecure and insufficient access to food. There has been very little evaluation of initiatives or projects that have included before-after designs or examined food insecurity outcomes to answer questions like "what interventions prevent food insecurity?" and "what interventions ameliorate food insecurity in the short and/or long term?". In particular, given the potential role that the social security system can play in prevention and relief of food insecurity, a robust examination of the social security system in relation to food insecurity is needed.

Current research has not systematically measured or mapped the scale of community support for food and/or buying essentials, beyond data provided by organisations such as IFAN and Trussell Trust. Very little research has been done to examine the food safety practice of the many organisations in the community food provision space.

7.6 Potential future research for the Food Standards Agency

Above, we have identified some key gaps in the landscape of research on food insecurity in the UK. Not all of these are relevant to the remit of the FSA but may be of interest to other Government departments, academics, wider civil society organisations or funding bodies. Below, we outline some key ideas that we think the FSA could invest in, given the work they have already done in this area and their strengths in social science and food safety.

- Expand analyses of data collected through Food and You 2.

The Food and You 2 dataset is incredibly rich, especially now that it has been running as a repeat cross-sectional survey since 2020. It offers many opportunities for a more robust analysis of risk factors for food insecurity, but these should move beyond descriptive statistics and use more advanced statistical techniques to allow for better understanding of independent contribution of different risk factors for food insecurity.

Importantly, this dataset contains information on food-safety related behaviours and outcomes. As already highlighted, there is very little research that has examined how experiences of food insecurity may make people more likely to engage in risky food behaviours or at risk of negative food safety outcomes.

Food and You 2 also collects information on food sensitivities and special diets. We also identified very little on these experiences in relation to food insecurity in the UK literature.

- A better understanding of the food safety-related practices of community food providers.

Building on the work that the FSA has already commissioned on how food safety is considered for people receiving community food provision, there is a need to better understand the potential risks posed by use of surplus food redistribution by community food organisations, their food safety practices, and in turn, how this surplus food is received and used by recipients. Whilst redistribution of surplus food is often viewed as a 'saving food from landfill', there has been little examination of what happens to surplus food once it reaches community food organisations. This may be of interest to the FSA for a number of reasons; first, what impact does it have on individual/household level food insecurity? Second, does the redistribution of surplus food pose any food safety risks to people receiving it and how does this depend on the practices of the organisations who are distributing it? There is also a need to better understand what proportion of surplus food may not be utilised if it does not meet aesthetic standards or the needs of people using community food organisations. This may be of interest given the FSA's strategic focus on sustainability.

- Further understanding of the use and interpretation of different survey measures of household food insecurity in the UK.

The FSA engages in measurement of food insecurity regularly through its Consumer Insights Tracker as well as through the Food and You 2 survey. As above, it also has explored different measures of food insecurity in its work on wider issues around food insecurity (Connors et al., 2022).

Given the discrepancy in figures from these different sources, as well as discrepancies in relation to other data on food insecurity collected in the UK, the FSA could take forward a review focused on explaining and interpretation of different household food insecurity measures in use in the UK.

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Household food insecurity in the UK: 8. References

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Household food insecurity in the UK: Appendix A: List of key search terms

List of key search terms

“food insecurity”

“food poverty”

“hunger”

“food deprivation”

“food crisis”

“food emergency”

“food hardship”

“food struggle”

“nutrition inequality”

“nutrition inequalities”

“food security”

“food safety”

“food handling”

“free school meals”

“food bank”

“social supermarket”

“food pantry”

“healthy start”

“breakfast clubs”

“holiday clubs”

“holiday hunger”

“meals on wheels”

“food poverty action plans”

“food strategies”

“food aid”

“community food”

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Household food insecurity in the UK: Appendix B: List of databases searched

List of databases searched

- Google.com
- PubMed.ncbi.nlm.nih.gov
- Scopus.com
- Gov.uk
- Gov.scot
- Gov.wales
- nidirect.gov.uk
- niassembly.gov.uk
- senedd.wales
- parliament.scot
- parliament.uk
- niassembly.gov.uk
- food.gov.uk
- gtr.ukri.org
- fundingawards.nihr.ac.uk
- thebritishacadmey.ac.uk
- wellcome.org
- Leverhulme.ac.uk