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Food Insecurity within UK Communities
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Research funded by a grant from Sainsbury's PLC

The remit of our evaluation was to answer three separate questions. First, who and where are people food insecure in the UK? Second, what is being done to help people meet their food needs, and how is this delivered? Third, what measures can be used to understand the effectiveness of different interventions?

Key Findings from the data analysis:

1. People move into and out of different levels of food security as economic and individual conditions change. A large proportion of the population will slip out of food security as the cost-of-living increases cut further into their budgets.
2. Cost of living increases will impact people in all areas but disproportionately impact those living in areas of greater deprivation even if they are employed full-time.
3. There are interaction effects between place and group membership, meaning the situation is worse for these groups if they live in areas of higher deprivation. The groups that are particularly vulnerable include:
    a. Households with children, particularly those with three or more.
    b. People with long-term health conditions, and particularly those in poor or very poor health.
    c. Ethnic minority groups
4. Nearly all adults use a supermarket or mini-market some of their time so shop for food. The level of food security a person experiences influences the frequency of shopping. People struggling to achieve food security are much more likely to shop several times a week, whereas a single weekly shopping is more likely to be done by those who are food secure.
5. Most food bank users experience very low food security; despite this, most of this group do not use food banks.

Implications for intervention support

1. Community-based interventions are needed to help rebalance and level-up areas disproportionally disadvantaged by food insecurity. These include interventions that help people to be able to stretch their budgets and access healthier food. This will be particularly important in more deprived areas.
2. Interventions that are sensitive to those living in rural areas are needed, particularly those that bring low-cost, healthy foods into more remote areas to help them avoid spending money on transportation costs.
3. Interventions that are sensitive to the specific requirements of the most vulnerable groups should consider transportation and utilisation barriers as well as dietary needs.
4. Interventions should be available and acceptable to those for whom they are intended to support. This will include how they are framed, how they are organised, and who is involved in the delivery.
5. Interventions that support capacity building, including food skills, employment skills, and community building, and that recognise the assets already available within local areas.
6. Interventions that have few stigmatising barriers to entry (e.g., those that are locally based and do not require demonstrations of lack or poverty), this does not mean that there

cannot be requirements such as a low financial cost, commitment to engage with tailored support, or requirement to procure foods such as fruit and vegetables.

Review of the evidence of the effectiveness of interventions

1. No evidence suggests that any one intervention type will fix all the problems of food insecurity.
2. Some interventions are preventative in that they improve cooking and budgeting skills, reconnect communities in ways that enhance resilience and address issues of nutritional food insecurity, improve well-being, and help people to stretch their budgets. These include food clubs and hubs, pantry schemes and cookery lessons.
3. To some extent, social eating and cook-at-home meals also offer many benefits of pantries, except skills enhancement concerning improving cooking and food budgeting skills.
4. Emergency food parcels. The greatest degree of evaluation focuses on emergency food parcels. These are shown not to prevent food insecurity, although they are recognised as lifelines for those struggling with very low food security. The evaluation also indicates that the food does not meet the nutritional needs of people. Finally, stigma and shame are strongly associated with foodbank use, which is an indicator of the unacceptability of the intervention.
5. Independent studies of food clubs, pantries or social supermarkets are scant. There are no external control trials. Findings from the literature are conflicting, with the most critical suggesting that these interventions alone do not prevent poverty. Other studies recognise that these are among many tools that can be mobilised to alleviate poverty and its effects. Research indicates that these schemes prevent a further decline into very low food insecurity and are helping people avoid the need for food banks. Other benefits associated with the schemes include healthier eating and increased fruit and vegetable uptake, greater access to food, an ability to express social values more widely held in society, decreased isolation, improved relationships with food, greater food knowledge, increased self-confidence, lower mental stress, and greater community cohesion, and access to other services.
6. There are no control trials of cookery lessons from the UK that we are aware of. Evidence from qualitative research and user surveys indicate they help reduce food bills, increase food and budgeting skills, provide social opportunities, improve diets and increase the uptake of healthy foods. It is not clear to what degree they prevent food insecurity or prevent food bank use, but there are suggestions that they improve nutritional security from studies in the UK.

Key outcome measures to indicate the effectiveness of individual interventions:

1. Changes in food security measures that indicate people and groups are moving into or toward high food security.
2. Positive indicators that local areas are resilient to food insecurity caused by national shifts (See discussions of the impact of national and local effects on Pg.8)
3. Changes that indicate higher levels of food security equity across regions and in places (see discussion starting on pg. 14)
4. Evidence of the prevention of decline in food security in rural localities (see discussion starting pg. 11).
5. Improvements in the food security of people who are in the most vulnerable groups.
6. Measures of increased weekly supermarket shopping among those who are food insecure (from more frequently and from less frequently, see discussion starting on pg. 24).

7. Increased uptake of fruit and vegetables among those who are food insecure (also in the discussion starting pg. 24).
8. Measures that demonstrate reduced stress and depression or increases in self-confidence and well-being.
9. Measures that indicate increased enjoyment of food, including increased enjoyment of cooking at home.
10. Indicators that demonstrate a reduction in the utilisation of emergency food parcels (see discussion starting on pg.28).
11. Measures that assess the acceptability of the intervention, such as take-up of the service or offer (see also the discussion on foodbanks starting pg. 28).
12. Measures that demonstrate social isolation within communities are reduced, such as people making new friends as a result of the project, sharing of information and food, and increased participation in social activities or volunteering (see discussion on pg. 32).

Summary Discussion

This report shows that increasing numbers of people within the United Kingdom are being pulled into food insecurity since the small improvements obtained as COVID started to recede. Small changes in circumstances give rise to large numbers of people moving into and out of different levels of food security (see also Moraes et al. 2020). The vulnerability to declines in food security is linked to locational conditions and characteristics alongside and intersecting with group circumstances. People move into and out of food insecurity as their individual, group, and locational circumstances change, which are all influenced by national conditions.

Food insecurity is fundamentally geographical. Rural, Urban and regional differences are explored in this study, but the IMD quintile area within which one lives is as important as national-level effects on food security. In some instances, as demonstrated by the analysis, local conditions can enable resilience in the face of national shifts. In other circumstances, they add to the burden people in those places experience. Interventions that make a difference in these local contexts are needed, and their effectiveness can be judged by changes in the measures of food insecurity outlined in this report. These include reductions in very low, low, and moderate food insecurity as well as increases in overall food security attributable to local effects.

While those who are out of work or unemployed are most vulnerable to food insecurity, this analysis has shown that for many, waged employment, including full-time employment, is not a means by which they can avoid food insecurity. This is particularly true for people living in areas that are more highly deprived.

While all groups are vulnerable to food security, particularly in areas of higher deprivation, certain groups are more vulnerable to food insecurity. Households with children, particularly three children or more, BAME communities, people with long-term health conditions and people in poor health are the most vulnerable. Interestingly and importantly, gender alone is not a variable that indicates high risk; however, there will be different factors that are likely to increase the chances of having low or very low food security, which is likely to affect men differently compared to women. More research is needed to identify these.

This analysis has shown that food insecurity and the strategies people use are complex, intersecting with the conditions and characteristics of the places where they live, their working status, the presence or absence of children, ethnicity, and health. The analysis indicates that there is a relationship between shopping more frequently than once a week

increases as food security levels decrease. While we do not fully understand the specific strategies people are using and the ways that they may be combining different food sources, this relationship suggests that people who are in high food security are more likely to shop at a supermarket or local store just once a week. However, this is only relatively weakly correlated as many food-secure people also do not shop weekly.

Food insecurity is linked to poor diet, affecting physical health. Research also shows that food insecurity increases stress, depression, and feelings of social isolation. Food is more than just nutrients and calories; its commensal qualities are an important tool for repairing and connecting communities. A vital requirement for being able to improve local resilience. The research finds that there is no single magic bullet that will fix the problems of food security. Different interventions bring different strengths, and the key is finding combinations that work synergistically in local places.

Food Insecurity within UK Communities

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Research funding supplied by Sainsbury's PLC

A person is food secure if they can access and utilise the food they need in the place where they live to have a healthy life. Access includes overcoming legal barriers to locally available food; for example, if your neighbour has food growing in their garden and they share it with you, this would give you access to food. It also includes being able to purchase food from a retail provider. The focus of this analysis is on this latter understanding of access as affordability, as data on food sharing is not available. It also does not cover aspects of food security related to the ability to utilise food that may be accessible. It indirectly highlights issues concerning the local availability of food through its focus on local variability in food security. Again, this is because the dataset analysed does not provide specific data about people's experiences travelling to the shop or what is available in their localities.

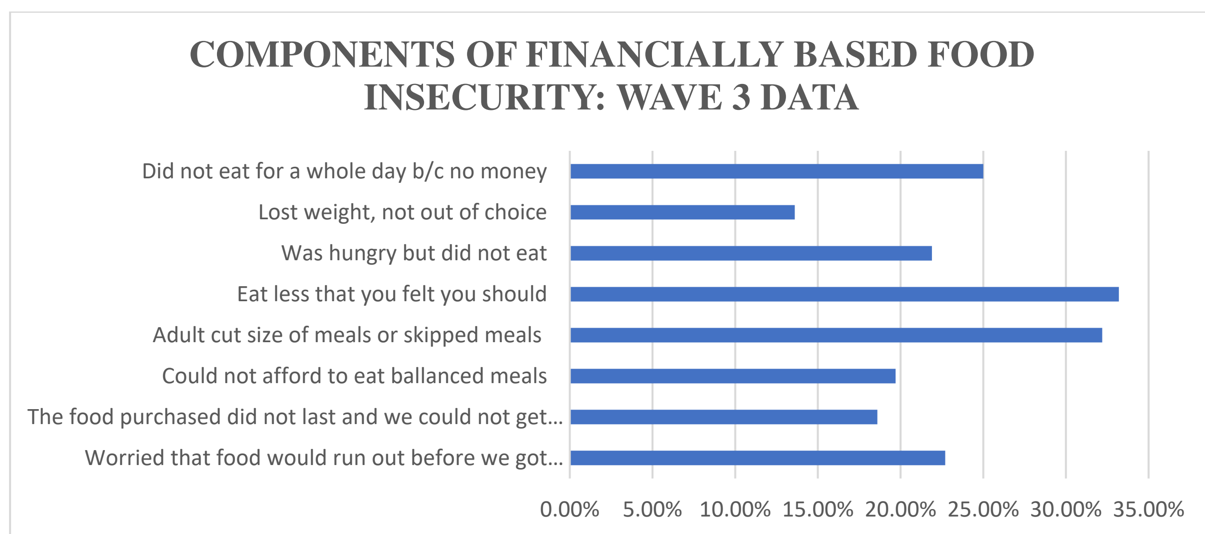
The remainder of this report proceeds as follows. The first section introduces the data that underpins the findings presented in the report. The analysis is then presented in the following order. It first focuses on changes in food security over time, starting in the Summer of 2020 and up to the Autumn of 2021. It then provides an analysis of where people were experiencing food insecurity and to what level, focusing on data from Spring 2021. The report then turns analyses the vulnerability of specific groups and how this vulnerability intersects with geographies of deprivation. The next two sections investigate how people manage their food consumption, focusing specifically on supermarket and foodbank use. These two food sources represent distinct ends of the food security continuum. Those who have high food security predominantly do not use food banks and source their food via a supermarket, versus those who are so food insecure that a food bank may be the only way that they can source food. As the report indicates, however, the percentages of adults who do not shop at a supermarket or mini-market at least sometimes are very small.

Food security is a continuum such that the boundaries between categories are permeable and whereby some individuals may be more or less food secure from one week to the next. The analysis finds that people who are food insecure increase the frequency of shops. This is likely to be a strategy for stretching their budgets. Most likely, they are going to the most local shop to avoid travel costs and are eating very inexpensive and low nutritional quality items, whereas those slightly more food secure, but potentially within the same category of security, will be looking for foods that are also heavily discounted. Furthermore, this report finds that food bank take-up among the very food insecure is relatively low overall, suggesting that this form of intervention is either not available or acceptable for many. This tells us we need a range of solutions to assist people at various stages of security and insecurity.

The final sections of the report review the literature on different forms of food support and their various benefits or contributions. There is limited control trial research, which means it is difficult to know the degree to which interventions make a difference to people's experiences. However, there is a certain amount of internal evaluation that provides insights into the measures that could be used to understand the benefits, should control trials be undertaken in the future. Interventions that specifically target children are not included in this analysis, instead the focus in on community based support.

Underpinning data and definitions of food security
The data presented in this document is based on an analysis of the Food and You 2 survey published by the Food Standards Agency. The Food and You surveys are considered official government statistics. Data covers England, Wales, and Northern Ireland. There is no comparable data for Scotland. (See Appendix 1 for more information on the Food and You 2 survey waves, including sample sizes for each survey). The analysis uses the recommended weightings for the combined populations and all surveys per the guidance.
Surveyed adults are 16 years and over. This is not the same survey as used by the Food Foundation. Although overall sample sizes are similar, the Food Foundation data includes Scotland, which uses a 6 month recall instead of the 12-month recall used in Food and You 2.

Food and You 2 uses the USDA methodology for determining an individual's level of food security. This is based on responses to several questions (identified in the graph below).



The question responses show that the most common strategies people employ include eating less than they feel they should, cutting or skipping meals and not eating for a whole day. Some of these questions also include frequencies, such as sometimes, often or occasionally.

There are four categories of food insecurity:

High food security: No reported indication of food affordability problems or limitations.
Marginal food security: One or two reported indications—typically of anxiety over food sufficiency or shortage of food in the house. Little or no indication of detrimental changes in diets or food intake.
Low food security: Reports of reduced quality, variety, or desirability of diet. Some indication of reduced food intake. Such as sometimes skipping or cutting back on meals.
Very low food security: Reports of multiple indications of disrupted eating patterns and reduced food intake. There will be frequent occasions of cutting back, skipping, or going without food for a day or more and reports of weight loss due to insufficient food.

People are placed into one of four levels or categories of food security, depending on how they answer all the questions, including those that express frequencies. As such, it is possible

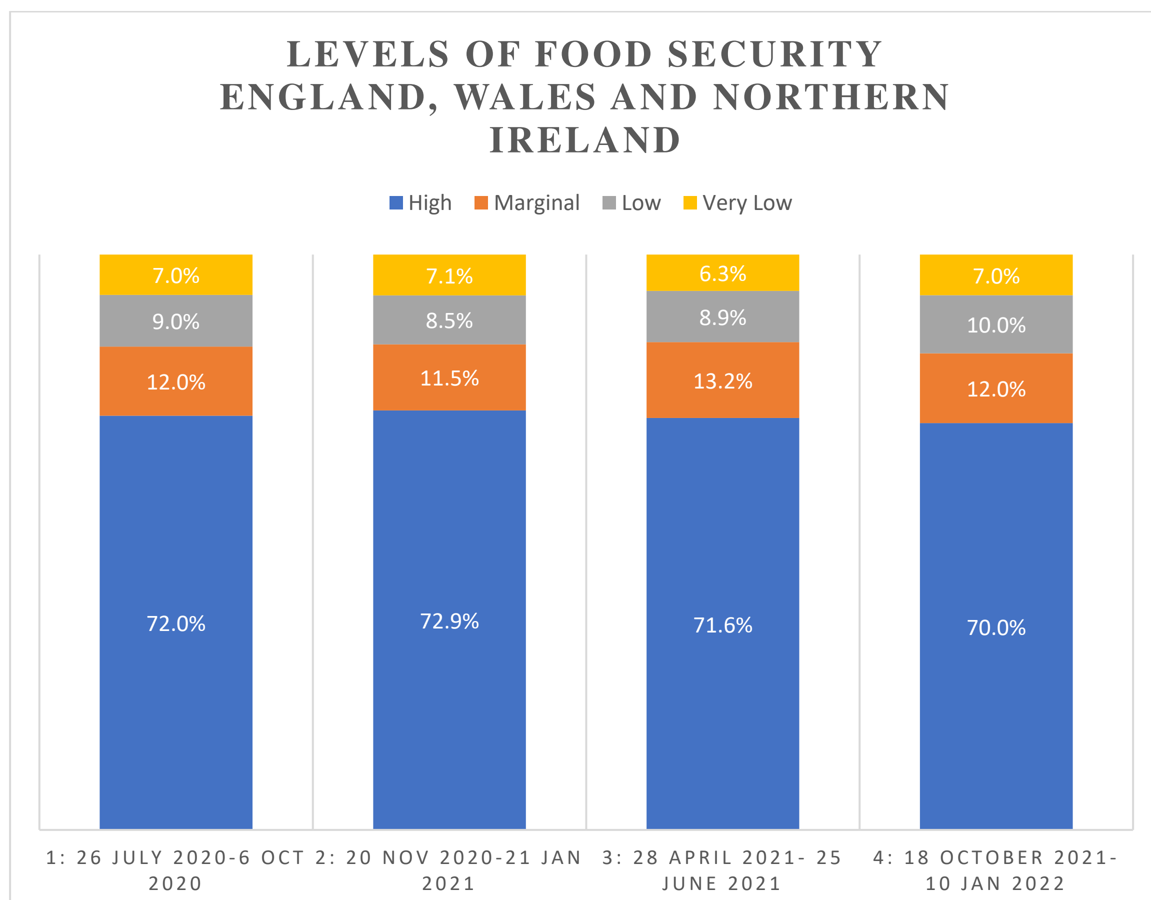
to skip a meal for a while day, but if you did this very infrequently, you would be allocated to the marginal group instead of the low or very low category.

Unless otherwise indicated, the analysis presented in this report draws from Food and You 2, Wave 3, which was conducted between March and June 2021.

Food insecurity over time
The chart below shows changes in adult food security over the period of the Food and You 2 surveys and includes all waves that are currently available. The first survey was conducted during the summer during the COVID-19 pandemic, which pushed people into lockdown. All lockdowns were lifted when Wave 3 was conducted, although those on Universal Credit were still receiving a £20 a week uplift. By the time of wave 4, this uplift had ended.

The combined estimate of adults living in England, Wales and Northern Ireland for Mid-year 2020 is 49.8 million. A one per cent change in these figures equates to approximately 500K adults (Stats Wales 2021).

At the time the first survey was conducted (survey dates are indicated at the bottom of each bar), 72% of the whole population had been fully food secure for the previous year. By wave two this had improved by one percentage point, but this recovery was lost by the spring of 2021. **By October 2021, the levels of full food security dropped to 70%. Approximately 17% of the adult population in October 2022 had experienced low or very low food security in the 12 months previously, approximately 8.5 million adults or about one in every six. A further 12% or slightly less than 6 million people had been marginally food secure.**



Put another way, between wave one and wave 2, approximately 440 thousand adults across England, Wales and Northern Ireland were pulled into high food security. By wave four, any improvements had been lost, and an additional 996 thousand adults were pushed out of high food security. Between wave two and wave 4, nearly 1.5 million adults lost their food security. Within the three lower food security categories, there will have been significant numbers who will have slipped more deeply into food insecurity

It is highly likely, given the changes in national policy, increases in costs associated with basics such as food and energy consumption, and the failure of wages to rise at the same rate, that these numbers are considerably higher now. We will not know for certain until the data are released in about a year. Although not directly comparable, the Food Foundation (2022) estimated that the rate of increase in the number of people who had either low or very low food security grew by 44% between Jan and April 2022. If we make the big assumption that rates of growth are going to be similar between the Food and You and Food Foundation, then the proportion of adults living with low or very low food security would be about one in every four and by the autumn and winter of 2022 the rates will be even higher.

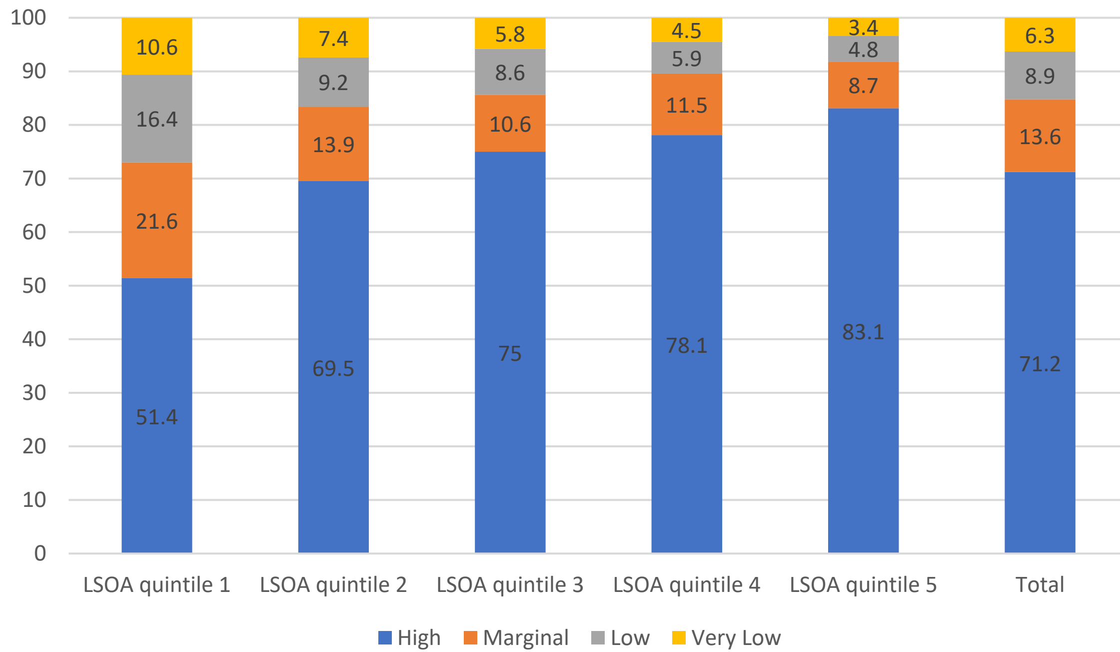
Geographies of Food insecurity

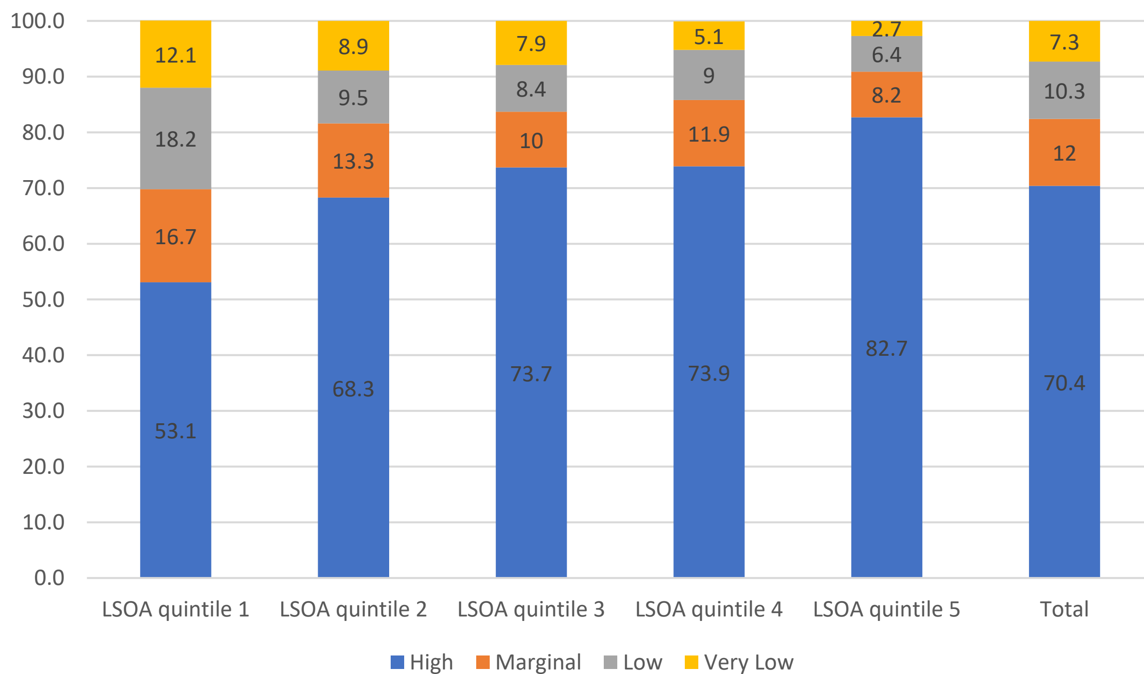
Food security is not experienced equally across different geographies. Different kinds of areas have certain defining characteristics that influence levels of food security in place. This includes how different groups become concentrated types of areas as well as the resources that are available to people in those places. Two distinct types of areas are those categorised by their IMD ranking and rural and urban distinctions. Regions are comprised of different mixes of these intersecting types of places. This section starts with a general discussion of food insecurity within different IMD quintiles and then examines the change in these areas that are attributable to these distinctions. What the analysis finds is that place characteristics and their locations matter for understanding vulnerability to food insecurity as well for understanding how interventions in those places may be working.

Index of Multiple Deprivation and Food Security

The index of multiple deprivation ranks Lower Super Output Areas (LSOAs) based on a composite score that includes income and employment, crime, education attainment, health, and environmental data. LSOA areas have an average population of about 1500 people. Because of the need to preserve the anonymity of respondents to the survey, we do not know exactly where people are located; however, the Food and You 2 team have aggregated the survey results into LSOA quintiles. As such, there are just under or just over 10 million adults represented within each quintile. Those in the 20% of most deprived areas are in quintile 1 and those that are least deprived are in quintile 5.

It is clear from the graphs below that every IMD area type has levels of food insecurity, including people struggling with very low food security. If you live in an area of high deprivation, the likelihood that you will be struggling to get the food you need without worry is considerably greater. Moreover, the likelihood that you will not struggle improves as the IMD becomes less deprived.





Comparing the two charts reveals that between the two periods, people slipped further into food insecurity by the Autumn of 2021. This is when mitigation measures put into place by government to protect household incomes ended. While people within all area types slipped further into food insecurity at various levels, largely apart from the most affluent areas. In

those areas that are most deprived areas a greater share of people entered low or very low food security. The addition of 1.5% equates to approximately 150 thousand adults.

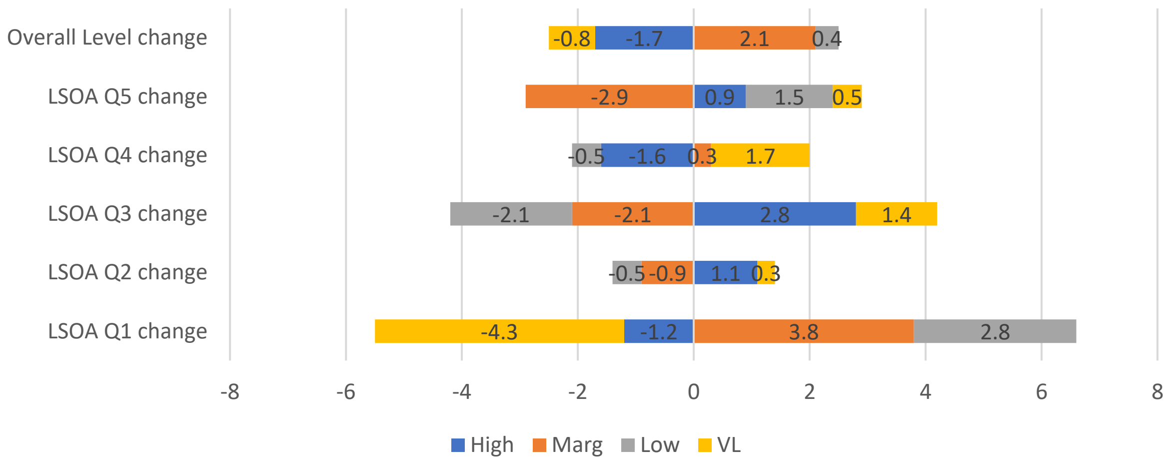
Looking at the period between wave 2 and wave 3, the chart below examines changes in the different levels of food security (Winter 2020 and Spring 2021). It shows that while overall the percentages of people struggling with food insecurity in the most deprived areas are greater, there is some variability in that change.

TOTAL CHANGE IN FOOD SECURITY BY QUINTILE AND LEVEL BETWEEN WINTER 2020 AND SPRING 2021, WAVE 2 AND 3

	% Change High food security	% Change Marginal Food Security	% Change Low Food Security	% Change Very Low Food Security
LSOA quintile 1	-2.9	5.9	2	-5.1
LSOA quintile 2	-0.6	1.2	-0.1	-0.5
LSOA quintile 3	1.1	0	-1.7	0.6
LSOA quintile 4	-3.3	2.4	-0.1	0.9
LSOA quintile 5	-0.8	-0.8	1.9	-0.3
National change	-1.7	2.1	0.4	-0.8

In the period represented, there were still safety net policies in place, although the impact of COVID-19 was easing. People were returning to work, and jobs were becoming available. While food costs were beginning to rise during this period, energy and fuel costs had not yet begun to increase. We can see that, for example, in areas of high deprivation (quintile 1), high food security decreased, just as the categories of very low and low food insecurity increased. It also shows that between the winter of 2020 and the spring of 2021, people in the most deprived areas were beginning to recover from the effects of the pandemic. It suggests that the uplift in Universal Credit was helping. It also indicates that there were specific place-based effects that influenced those changes in circumstances.

The next chart provides figures to indicate what additional change in each food security category is attributable to specific local effects and what proportion of change is attributable to general changes in policy and wider effects that impact people regardless of where they live. It shows that the characteristics of places measured by IMD matter to food security in those places. If, for example, there are few job opportunities in those places, one of the indicators in IMD, people with employment living in those places will have to travel further to get to work. Fuel prices are making that harder. On top of this, the jobs that people in more deprived areas tend to have are those that are low-waged and include jobs in food production and retail, hospitality, adult social care, cleaning, transportation, child care, and so forth. Increasing inflation is likely to impact these sectors to the extent that they will experience a squeeze from, on the one hand, increased costs associated with doing business and decreased revenues because people can no longer afford to engage with their services. Business closures and job losses in these sectors are inevitable and will impact higher-deprivation localities disproportionately. Ironically, many of these jobs were seen as essential during the pandemic.



The rate of change in the period would equal the overall level of change (the top bar) if people in all types of IMD area experienced food insecurity in the same way. The LSOA percentage change indicated on the graph above show what additional change and the direction of that change is attributable to these place-based characteristics. The calculation subtracts the national change (the bottom row of the table above in a particular category of food security from the change for a specific locality type (L) and category (C) ($L_C = T_{LC} - N_C$). This model assumes that the overall population in each type of area did not change substantially in composition or size.

For example, nationally, there was a decline in the percentage of people who experienced high food security. Not all types of places saw this decline. LSOAs in Q2, Q3, and Q5, had increases that went against this trend to the extent that the gains in high food security were greater than the losses due to national factors.

Nationally, very low food security decreased by just under one percentage point among adults. This is mainly the result of what was happening in areas of low deprivation. What can be learned from this chart is that in areas of very low deprivation, the overall improvements away from very low food security are more likely to be attributable to the circumstances and changes to the conditions of those living in these areas as well as any interventions that were implemented during and after COVID to help people in these places. While we do not know specifically what impacted this change, it is likely to be a mix of benefits improvements that were in place at the time, the opening of employment opportunities that residents of these types of places are more likely to be involved in or attracted to compared to other areas. Several place-based changes were introduced during COVID to target these areas. Many local authorities began developing local food plans to support people during this time. There were also Free School Meal vouchers available over the winter holidays as well for children who qualify. However, for those living in an area without a participating food store, the vouchers did not address availability problems, which meant using the vouchers proved difficult. In all other types of localities, the rates of very low food insecurity increased.

Those located in quintile 2 areas saw the least about of change overall, either negative or positive. Whereas the other three IMD quintile areas show patterns whereby some people were pushed downward into lower levels of food security during the period. Quintiles 3 and 5 also indicate some people were able to move out of some level of food insecurity to become fully food secure. Without being able to track individuals specifically, this may be linked to the people in these areas having jobs that enabled them to return to full employment as lockdown ended, or it may be that their expenses reduced such as childcare with the re-opening of nurseries and schools.

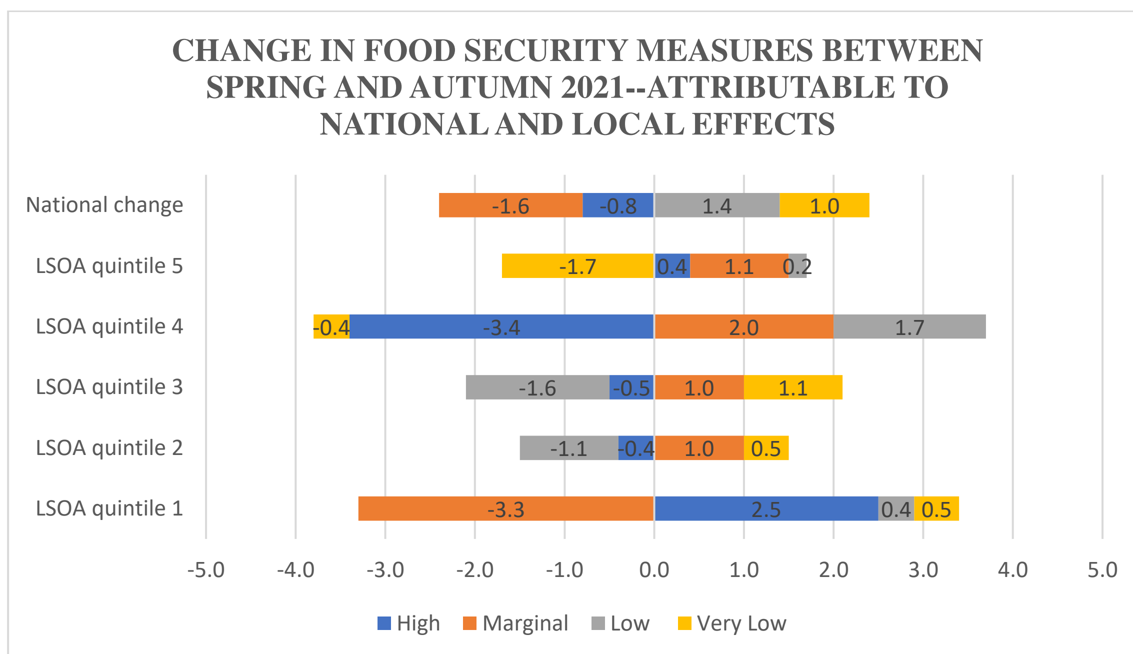
A similar examination of the period between Wave 3 and Wave 4 further demonstrates both the fluidity of food security in people's lives and the degree to which national policy changes differentially impact on local places.

TOTAL CHANGE IN FOOD SECURITY BY QUINTILE AND LEVEL BETWEEN SPRING 2021 AND AUTUMN 2021, WAVE 3 AND 4

T2-T3	% Change High food security	% Change Marginal Food Security	% Change Low Food Security	% Change Very Low Food Security
LSOA quintile 1	1.7	-4.9	1.8	1.5
LSOA quintile 2	-1.2	-0.6	0.3	1.5
LSOA quintile 3	-1.3	-0.6	-0.2	2.1
LSOA quintile 4	-4.2	0.4	3.1	0.6
LSOA quintile 5	-0.4	-0.5	1.6	-0.7
National change	-0.8	-1.6	1.4	1.0

The fact that any recovery in food security by those by those living in Quintile 1 localities was lost is striking. There is some overall increase in the number of people who became food secure, which is likely to be linked to returning to full payment for work, but this is overshadowed by increases in the number of people who slipped into low and very low food security out of marginal food security. In all the other IMD areas, overall food security decreased, which cascaded down into the other dimensions of food insecurity. Only in the least deprived areas were people pulled out of very low food security.

The next graph disaggregates national effects from local effects for the period. Rates of low and very low food insecurity increased, while high and marginal food insecurity decreased. Much of the increase in high-deprivation areas in low or very low food security resulted from national-level effects rather than local effects. One key change between the two survey dates was the opening of the economy after COVID and the withdrawal of the £20 a week uplift to universal credit. In these same places, however, reductions in marginal food security and increases in high food security were largely the result of local effects rather than national-level processes, as discussed previously. Only the least deprived areas see local effects that offset these national effects regarding high food security. In quintile 4 there were some local recovery effects, but these were not enough to rebalance national effects on those who are highly food insecure. Additionally in quintile 4 areas, local effects that negatively impacted on high food security exacerbated what was happening nationally, as by the autumn prices were beginning to rise, there were increased import and export costs and shortages, and COVID business support measures were withdrawn.

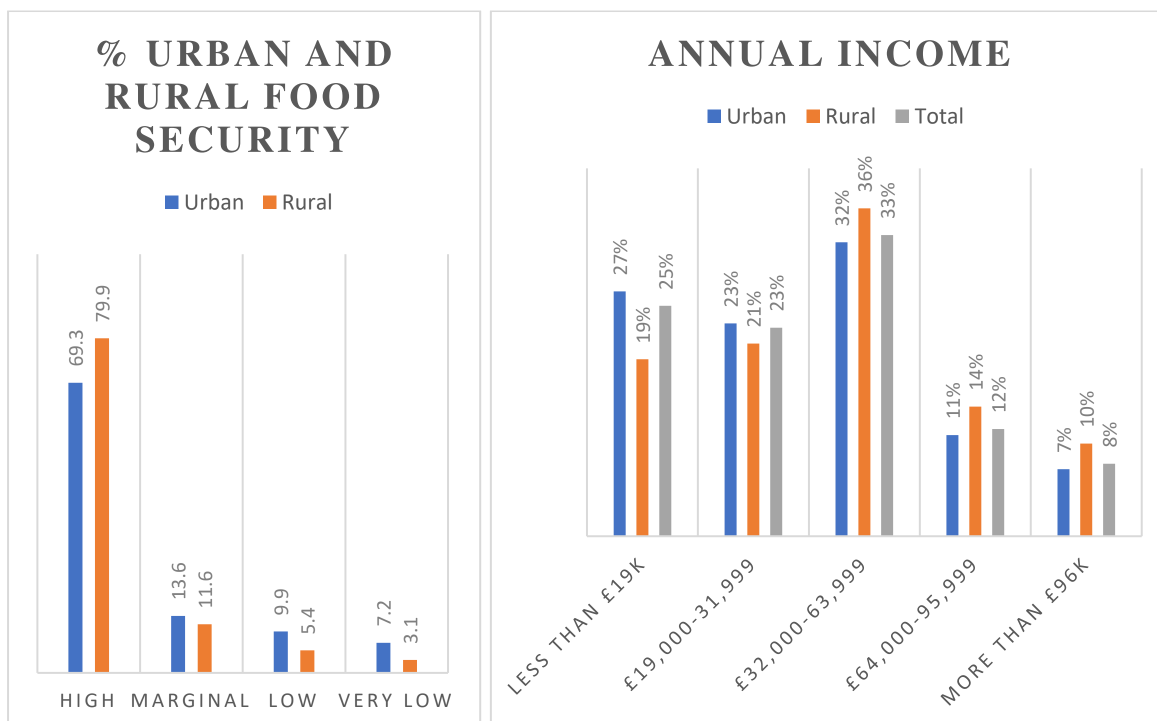


In summary, national policy shifts that occurred between survey waves three and wave four halted progress that was being made in the most deprived areas had a mixed effect in quintile two and three areas with some showing improvements in their circumstances. Even in the least deprived areas, reductions in food insecurity were offset by changes in government policy and national economic shifts.

IMD remains an important though not exclusive indicator variable for determining food insecurity because it brings together concentrations of individuals with certain characterises that leave them more vulnerable but also specific place-based effects that act independently on people's ability to be resilient in the face or hardship or become more vulnerable.

Urban and Rural Areas and Food Security

There are challenges and opportunities concerning food security for people living in rural places compared to those living in urban localities. About 78% of survey respondents live in urban LSOAs compared to 22% who live in rural LSOAs. Food security overall is higher in rural areas compared to urban areas. Possible reasons for this include the higher income profile of rural residents compared to urban residents, with a distinctly smaller number of people earning less than £19K per year. Some also argue that there are greater opportunities for self-provision in rural spaces compared to urban environments. The general health of rural populations also tends to be better than those who live in urban areas. In rural areas, 81% of respondents indicated their health was good or very good compared to 76% of urban residents. In urban areas, the rate of people indicating they had bad or very bad health was almost double that for those living in rural places (4.7% compared to 2.5%). These patterns are illustrated in the charts below.



Despite this overall picture of rural advantage, there is some indication in the data that those living in rural LSOAs that are also among the most deprived are very likely to be not fully food secure. Although sample sizes are very small, the data suggest that just 2 out of every 5 people living in high-deprivation rural areas were fully food secure. IMD, however, is less robust as a predictor when considering rural food insecurity. This is linked, to the fact that LSOAs are based on population rather than geographical area. As a result more densely populated areas will have geographically smaller LSOA regions compared to areas where population density is low. Restated, A rural LSOA may encompass many square miles compared to an Urban LSOA that is just a city block or two. As such, even less deprived rural localities are very likely to encompass pockets of people who are struggling.

With rising energy costs, food insecurity in rural areas will likely deepen. Not only is the energy needed for the safe storage and cooking of food, but people also make trade-offs between heating and eating. According to a DEFRA (2022) report focusing on England, rural energy costs are considerably higher for those in rural areas because homes in rural areas are less energy efficient. They estimate that the fuel poverty gap, the extra earnings needed to avoid being fuel-poor, for those living in rural villages, hamlets, and isolated dwellings, was £501 per year. This compares to £193 in urban areas. Fuel poor is defined as where a household living in a property with a fuel poverty energy efficiency rating of band D or below in a home that cannot be kept warm at a reasonable cost without bringing their residual income below the poverty threshold. These calculations reflected energy costs in 2020. Given recent and projected increases, this poses a threat to food security, particularly for rural residents.

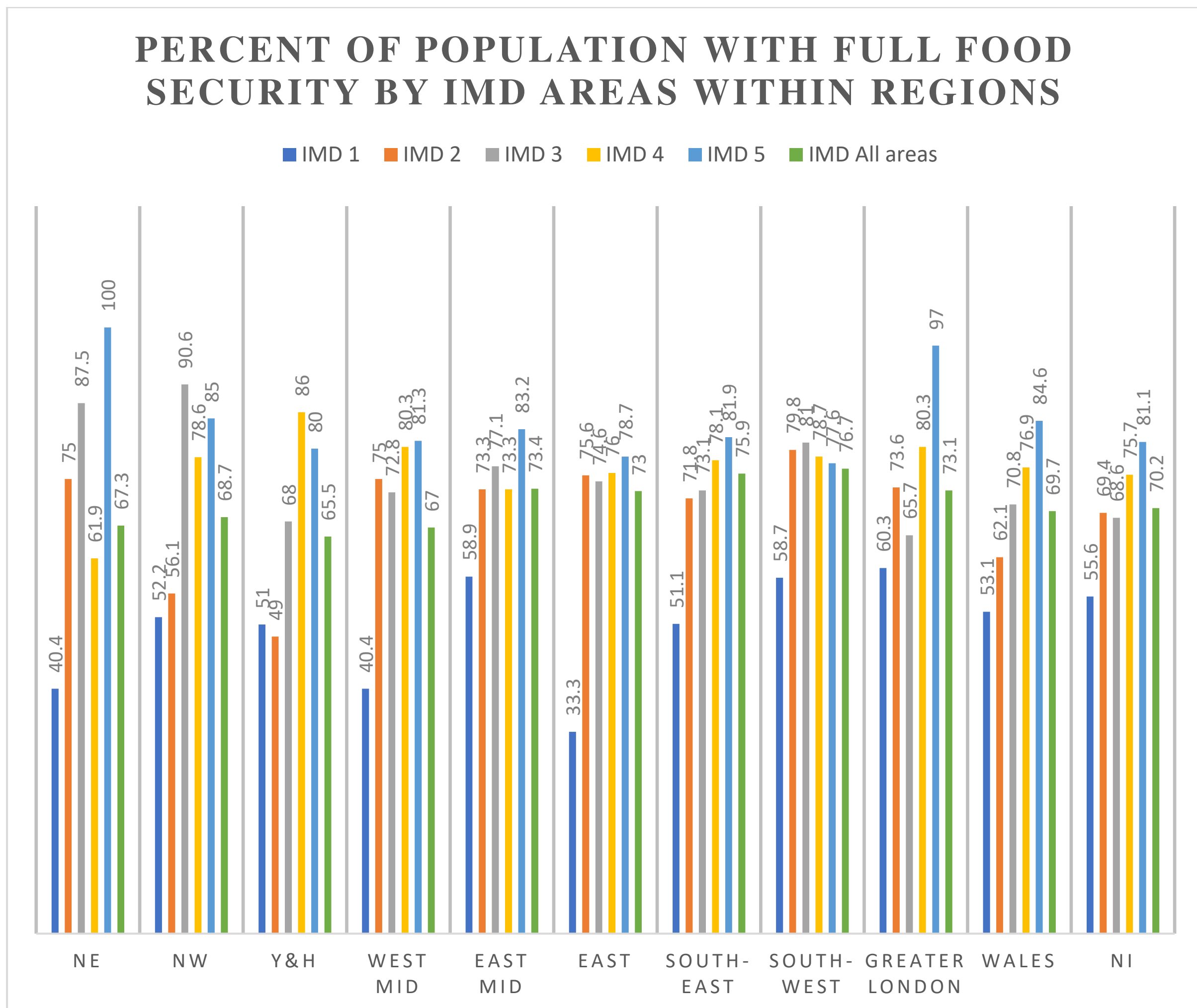
Regional Variations in food security

Vulnerability has a distinct regional geography to it because regions are differentially comprised of population concentrations, numbers of areas within the different IMD quintiles and the amount of rural space that they comprise. Each region has different cultural traditions, political orientations, and community-based safety nets. The map below identifies each region and the local authority areas that they include.

MAP OF UK REGIONS AND LOCAL AUTHORITY AREAS

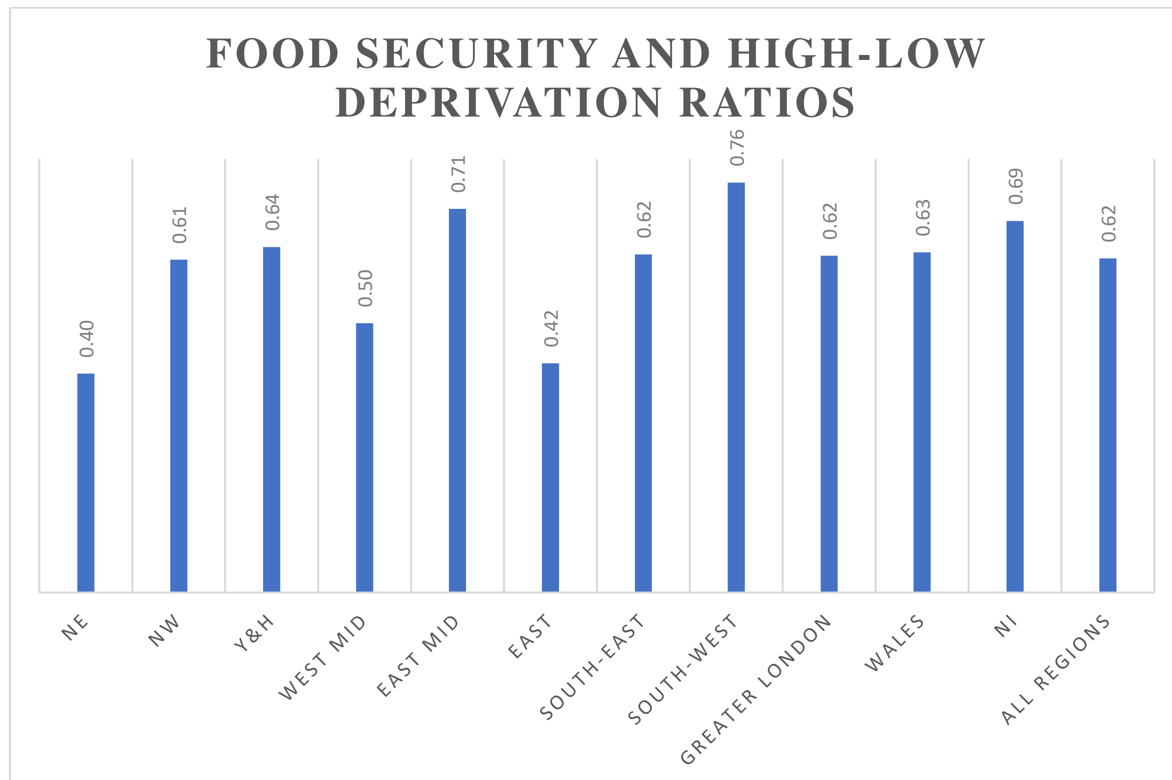
Source: UKMaps 360

The region with the lowest overall level of high food security is Yorkshire and the Humber (65%) followed by the West Midlands (67%) and the Northwest of England (69%). The regions with the highest overall food security include the Southwest of England (77%), the Southeast of England (76%), the East Midlands and the East of England (both 73%).



While overall levels of food security are lower in some regions, the experience of food security is considerably less for those living in highly deprived areas. For example, despite high overall levels of food security in the East of England comparatively, only one out of every three people (33%) living in a highly deprived area (IMD1) are fully food secure. This region has the lowest levels of food security for those living in highly deprived areas. The east of England includes Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, and Suffolk. Compare this to Greater London, where the rate goes up to almost two out of every three people living in highly deprived areas are fully food secure. Other areas with the lowest levels of food security in the most deprived areas include the Northeast of England and the West Midlands, with just 40% each.

Social divisions are expressed through a score calculated by dividing the percentage of high food security in most deprived areas by the percentage of high security in the least deprived areas. A score of one would represent perfect equality, whereas lower scores indicate increased division. Areas of greatest parity between high and low deprivation areas include the South-West (.76) and the East Midlands (.71). Disparities between high and low deprivation are greatest in the Northeast of England (.4) and the East of England (.42).



We do not have clear evidence for why these ratios exist, but one could speculate. There are different national mechanisms in place to support struggling households and areas in Wales and Northern Ireland compared to England. Local-scale interventions and conditions may also make an important contribution toward levelling out these disparities. There are, for example, a concentration of low-cost food options and many support mechanisms in place within London, which despite having very high levels of full food security in the least deprived LSOAs (97%), has the highest levels of security in the most deprived areas (60%). Compare this to the Northeast of England, where virtually all people living in low-deprivation areas are food secure. Still, only 40% of people living in high-deprivation areas are food secure. Based on analysis of FareShare data of charity partners who receive food through their services, there were relatively few charity partners operating in Durham and Northumberland, with some areas of high deprivation having no support provision at all via these means (for an interactive map see: https://arcg.is/1bKDv10). This data is a reasonably good indicator of food support across the country. Still, it is not perfect, as not all charity organisations provide food to communities via the FareShare network. Since wave 3 of the Food and You 2 survey was conducted, new interventions, including community food clubs provided by The Bread and Butter Thing, have been introduced to areas in Durham, and it will be interesting to see what impact this has not just on individuals but also on the regional disparity figures.

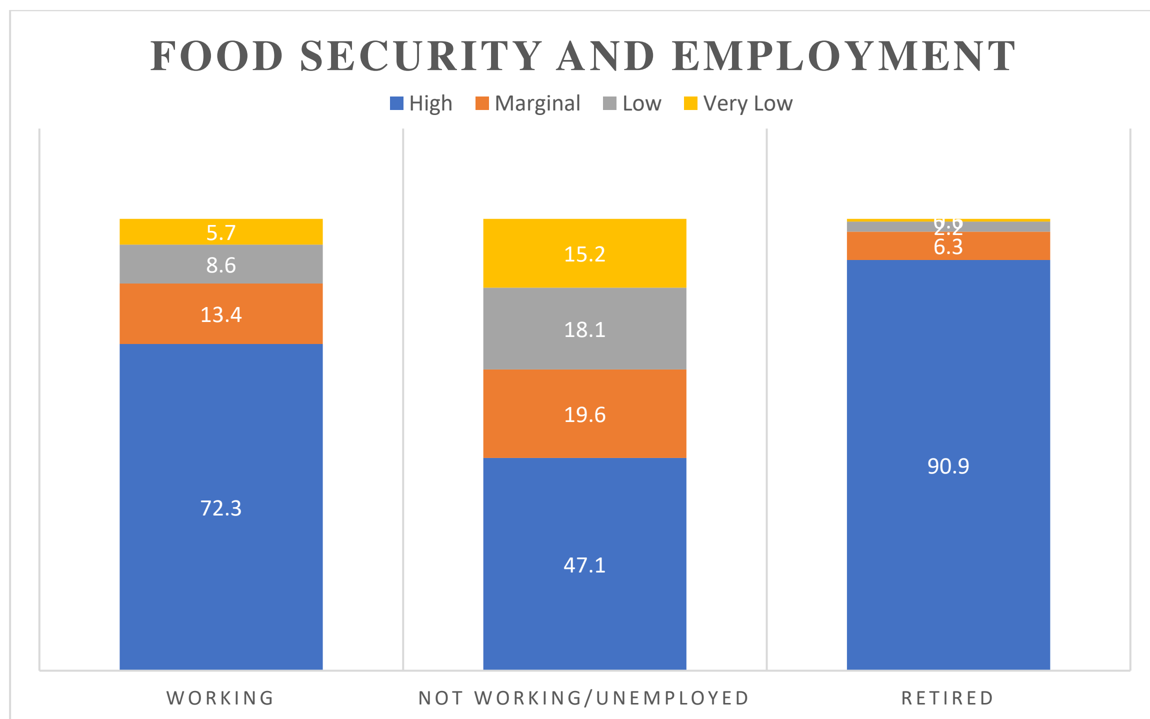
What this part of the report has demonstrated is that food insecurity is not equally present in all areas. There are complex interactions between the type of place (e.g., levels of deprivation, rural or urban) and where those places are located. This is strong evidence that what is needed are both national-level interventions, but also targeted interventions that meet the needs of those localities. The discussion also suggests that by using indicators such as a change in overall food security once an intervention has been introduced, looking for changes in the ratios of food security in highly deprived and low-deprived LSOAs within a place or region can also provide insights. Before moving on to discuss the different community-based interventions, the report now turns to an examination of how certain groups experience food insecurity differentially.

Group Membership and Food Security

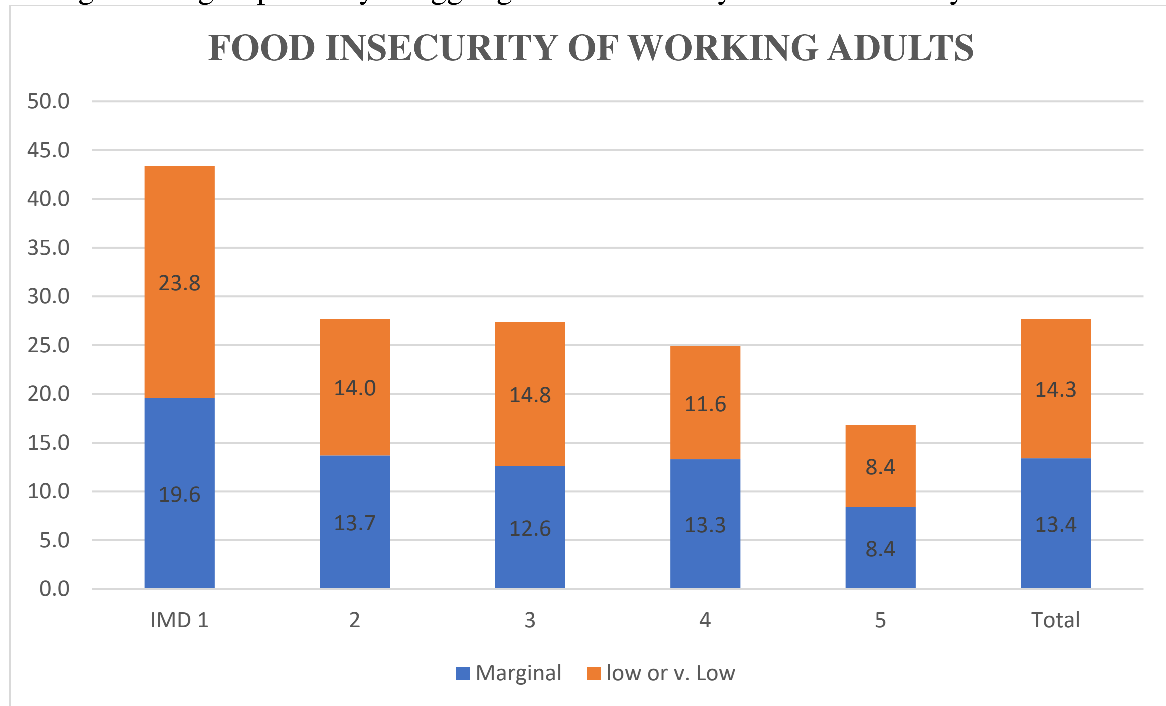
Just as food insecurity is not experienced similarly across places, groups have different advantages and disadvantages. This next section of the report focuses on different groups of people. Where the sample sizes are sufficiently large, it also discusses how vulnerability shifts depending upon the IMD quintile within which they live. Areas of focus enabled by the survey questions include Employment status, gender, having children, ethnicity, and health status.

Employment

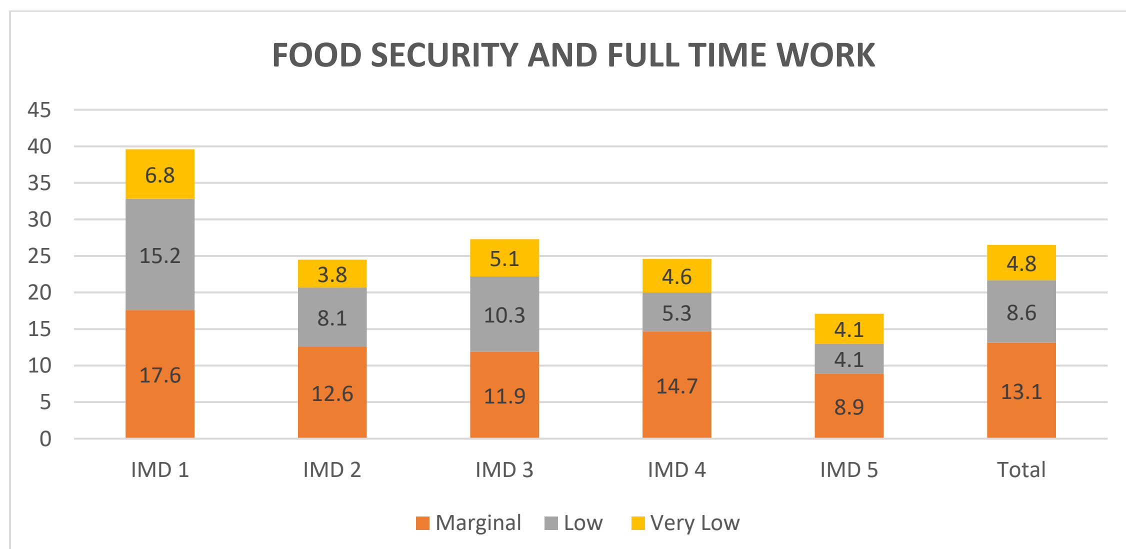
Employment is not a guarantee of food security, and support for those who are not working is not sufficient. Retired people are the most food secure. Nationally one in every seven working adults is struggling with low or very low food security. A further one in seven working adults is also worried about their financial food security. These rates increase significantly for those who are not working or are unemployed. More than half are worried or struggling. One in every five adults in this group is worried, and a further one out of every three is living with either low or very low food security.



As discussed earlier, where working people live also has an exacerbating relationship with their levels of food security. Working adults living in areas that have the highest levels of deprivation also have the lowest rates of food security among all working adults. The group who are worried about their food secuity, and who are vulnerable to falling into insecurity as prices increase and potentially through job losses created by layoffs and business closures are as large as the group already struggling with low or very low food security.



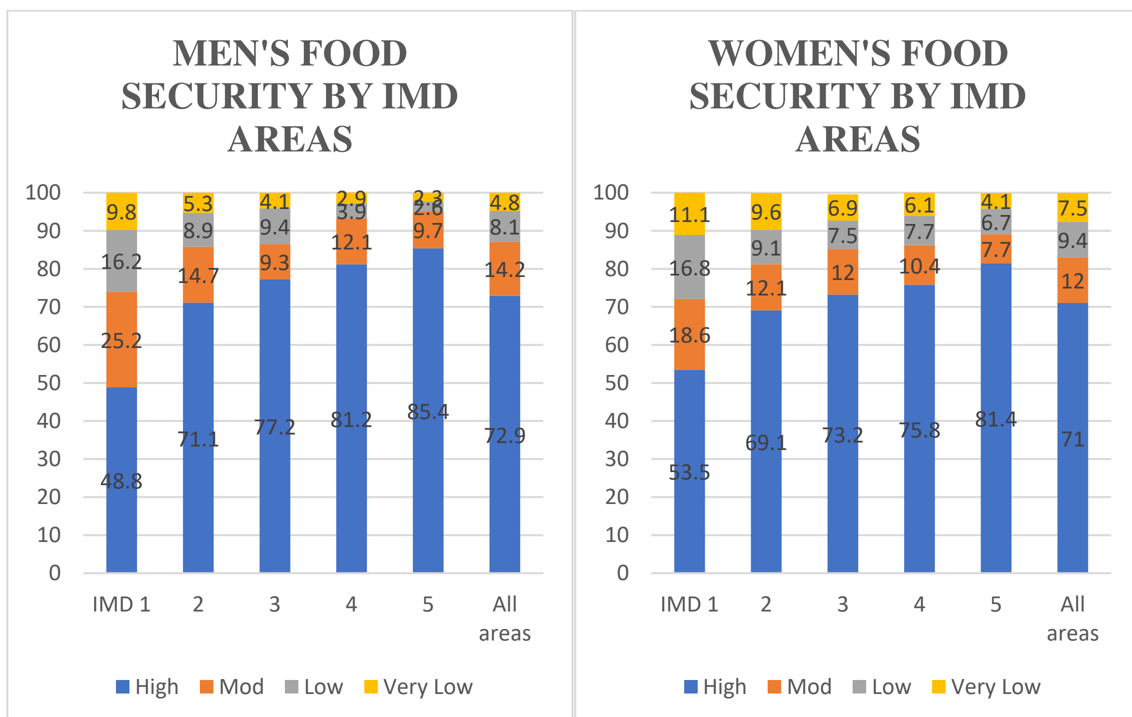
While the situation improves slightly for those in full-time employment, the percentage that is fully food secure in high-deprivation IMD areas is still low at only 56% (compared to the national rate of 72% for wave 3). What is equally telling is that the number of people who are likely to be worried about their security (the marginally food secure) has about an equal share compared to those who are already struggling with low or very low food security. Also notable is that food insecurity among working adults is not absent in more affluent areas. Given that support and acceptability of interventions is geographically variable, how help is provided to these groups will need to be carefully considered.



This part of the analysis shows that benefits are not meeting people's needs, but also that working and even working full time is not, for many, a route into food security. While national policy shifts such as changes to Free School Meal eligibility thresholds, improvements in benefits, and a higher minimum wage are important for making a national-level change, the analysis clearly shows that local-scale interventions that enable people to stretch their budgets or provide them with sufficient income are going to be important for an evening out the local and regional effects of food insecurity.

Gender

The proportion of women who are fully food secure is about two per cent less than that of men (71% and 72.8%, respectively). Within those who are not fully food secure, women are more likely to be classed as having low or very low food security. As indicated in the charts below, although levels of food security increase as the levels of deprivation in the area where the person lives decrease, the disparities between men and women generally remain.



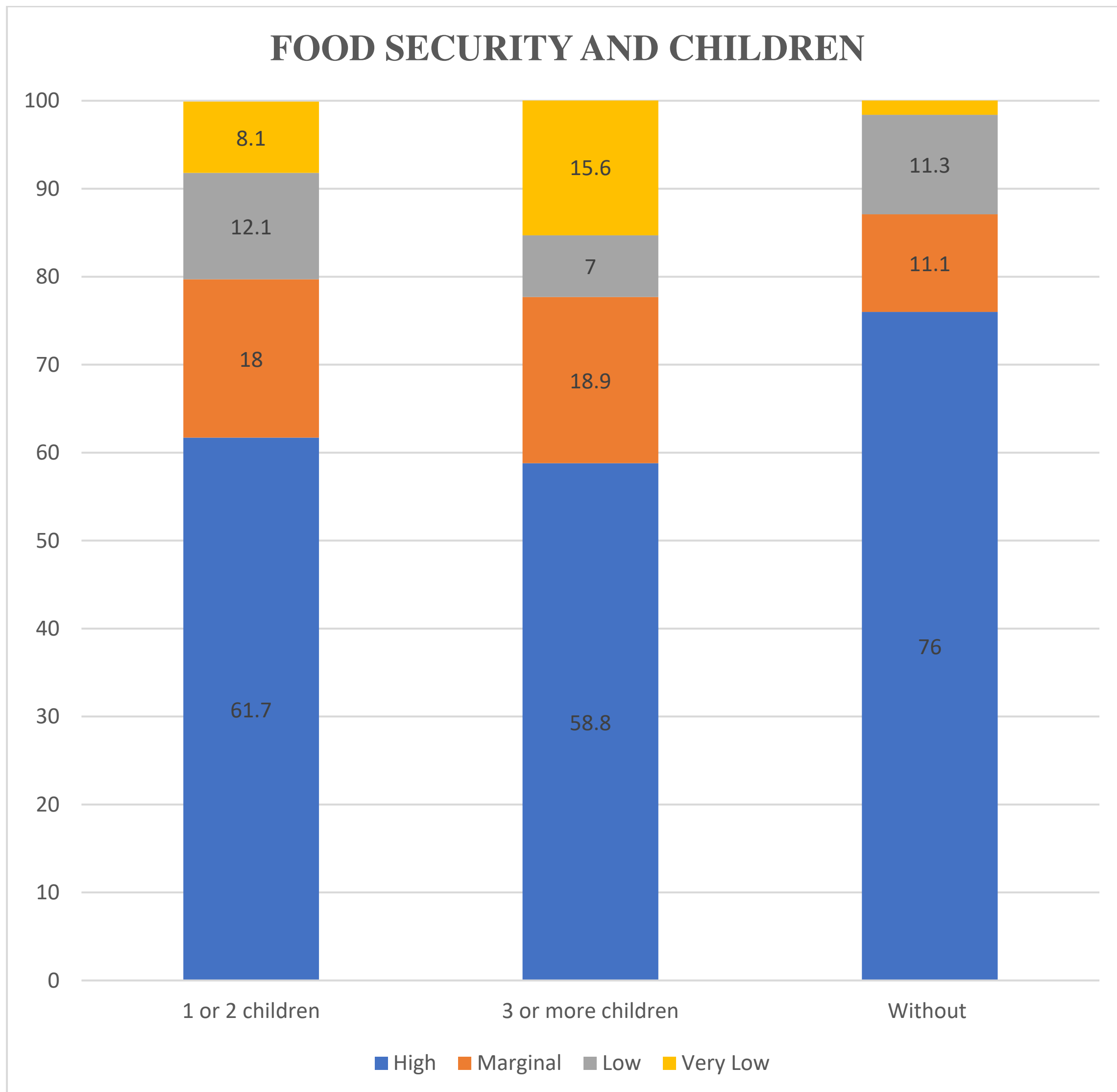
There is one area of difference that is notable, men living in the most deprived areas have lower rates of food security compared to women, but this disparity is contained by the marginal food security category. Women in these areas have higher rates of very low food security compared to men.

Importantly, while the gender of the person may not be a strong determinant of food insecurity, the way interventions are gendered, and the roles that women tend to play within households and communities are likely to make a difference in how they are taken up and accepted.

Adults with children

Adults with children are more likely to have some form of food insecurity, and this is particularly the case for those with three or more children. In these households, periods when children are off school are likely to be the most difficult because of the lack of free school meals. For those in England who applied for Universal Credit on or after 1 April 2018, household income must be less than £7,400 a year (after tax and not including any benefits)

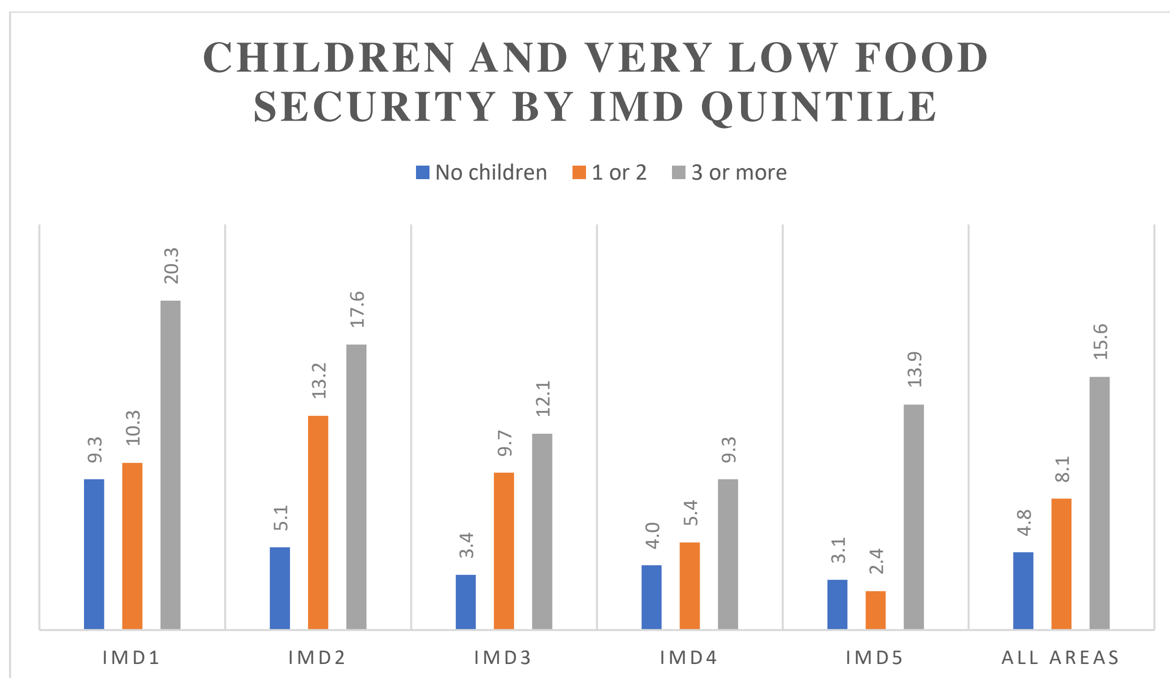
to qualify (https://www.gov.uk/apply-free-school-meals). This threshold does not consider the number of children within the household. All children in reception, year one, and year two receive free school meals. Free school meals for all primary school children will be available in Wales by 2024; however, children in Northern Ireland and England will not have this benefit. In England and Northern Ireland, some children who are in year three and above do not qualify regardless of household income, for example, if they have no recourse to public funds (this is at LA discretion).



Children increase the likelihood of having very low food security. The increased likelihood for households with one or two children is 1.7 times the rate of those with no children. It is 3.3 times the rate of no children when there are three or more children. For those with three or more children, the odds range from 2.3 times in areas that are most deprived to 4.5 times as likely in areas where deprivation is very low.

Across all areas, the percentage of people with no children who are food secure is 76.2%. This falls to just 61.8 per cent if there are one or two children and then drops to just 58% where there are three or more children present. Rates of very low food insecurity where there are three or more children present are considerably higher across all IMD areas. However, in areas that are the most deprived, one in every five adults with three or more children

experiences high food insecurity compared to one in ten adults with fewer than three children. Of particular interest is the vulnerability of three or more child households in very low-deprivation areas.



These vulnerabilities can be expressed as risk ratios where the likelihood of food insecurity for those who have no children is the comparative measure. As deprivation decreases, so does the food insecurity for no-child households, except for IMD 5 areas where rates of food insecurity for households with one or two children are lower than for those with no children. For adults with three or more children, the risk ratios increase, apart from IMD 4 areas, which still have higher risk ratios than IMD1 areas.

LOW FOOD INSECURITY ODDS RATIO COMPARED TO WHERE THERE IS NO CHILD

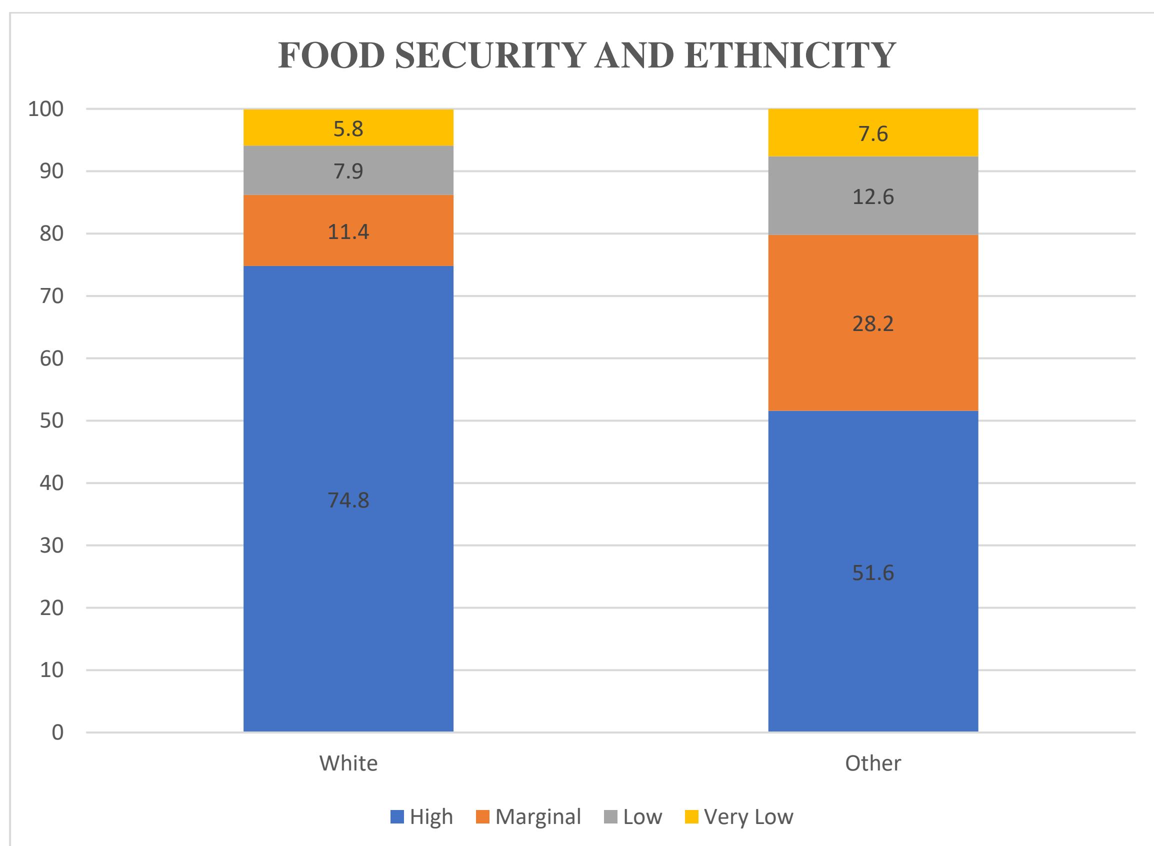
Children	1 or 2	3 or more
IMD1	1.1	2.2
IMD2	2.6	3.5
IMD3	2.9	3.6
IMD4	1.4	2.3
IMD5	0.8	4.5
All areas	1.7	3.3

Food insecurity in households with children is higher overall in the most deprived areas. Infrastructures and cultures may prevent households in less deprived areas from accessing support they may be entitled to, which is more easily accessed in more deprived areas. There is evidence that families who participate in free school meal programmes and holiday

activities use these as a strategy for stretching food budgets. There are reports that children feel stigma when accessing free school meals in areas where fewer households rely on them. There may also be fewer community-based activities targeted at these households in less deprived areas, such as holiday activities that feed children. This is likely to increase hardship for families with children, but those with three or more children disproportionately. Interventions to support these households must guard against increasing stigma as this is a barrier to accepting support, particularly in areas where the norm is to not need this support.

Ethnicity

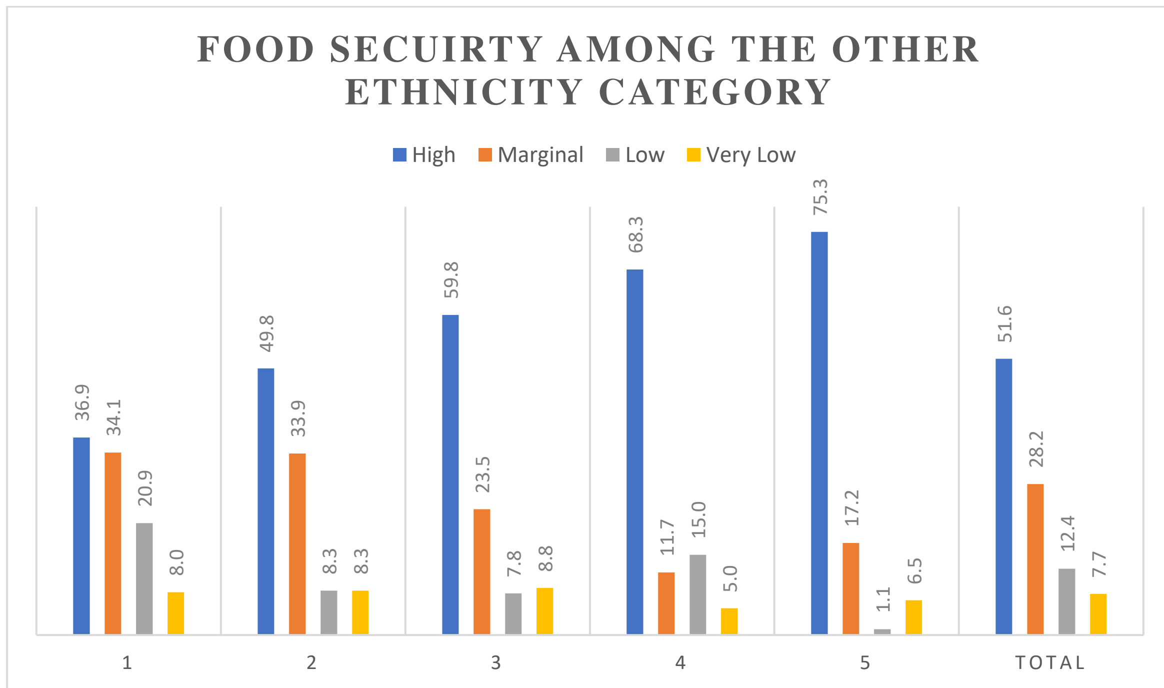
The Food and You 2, Wave 3 data provide two categories of ethnicity: White and Other Ethnic Groups. Those within the other ethnic group are generally less food secure than the white group—51.6% have high food security compared to 74.8%. The risk ratios are highest for marginal food security. Sample sizes are not sufficiently large to disaggregate further. Not belonging to the white ethnic category reduces overall food security.



Those who are white have higher levels of food security over all compared to the other category group. Only one in every two adults who belong to the other category is food secure. The size of the marginal food security group also indicates that a large proportion of this group is vulnerable to deeper food insecurity. An increasing number of people from this group will likely find themselves struggling in the months to come.

Looking at IMD and food security for the other category, the patterns are similar. Areas with higher deprivation rates are also those areas where people struggle more. Only in those areas where deprivation is lowest do those in the other ethnic group achieve rates of food security similar to the national averages but below the rate for that area type. Nearly two-thirds of all adults who belong to the other group live in IMD quintile areas one and two (64%). The

national rates of food security for the whole population. Only about one in three adults belonging to the other category who live in IMD 2 areas are fully food secure. As deprivation decreases, the rates of food security increase, but it is only by IMD 5 that the rates of food security are equal to the national average for all populations in all places.



In all IMD quintiles, food security rates for the other category are lower compared to the white group in that same quintile. In the table below, where a figure is less than one, the other group has fewer adults in that food security category for that location. Where numbers are greater than one, there are greater concentrations of adults. A figure of one is parity with the white population in that area. For example, the rates of low food security in IMD area three are equal for the white and other categories. Risk of very low food security is much greater for the other category, by a factor of two to one, in IMD 3 areas, but it is less likely in IMD 1 areas compared to the white category.

RATIO OF OTHER ETHNICITY TO WHITE BY FOOD SECURITY GROUP AND IMD

IMD quintile		High Food Security	Marginal Food Security	Low Food Security	Very Low Food Security
Most disadvantaged	1	0.68	1.78	1.33	0.75
	2	0.68	3.36	0.87	1.09
	3	0.77	2.47	0.99	2.00
	4	0.86	1.03	3.00	1.14
Least Disadvantaged.	5	0.88	2.15	0.31	1.97
All areas		0.69	2.50	1.57	1.33

Marginal food security is the area of greatest risk for this other category. Interventions that seek to support those who are not in very low food security but instead help them to stretch their budgets are likely to be important for those in the other category and will be an important preventative measure. Because other ethnic groups are likely to have foodways that differ from traditional British diets, sensitivity must be directed toward the needs of these groups, ensuring that if food is provided, it meets these needs. Some religious groups also do not allow borrowing, so microloan schemes may also not work. Cooperative buying may be an alternative solution for these groups.

Health conditions
The final vulnerable group to be explored in this analysis are those with Long Term Health Conditions (LTHC), representing approximately 31% of the adult population. Overall, food security among this group is lower compared to those who do not have long-term health conditions.

VULNERABILITY RATIOS COMPARING THE THOSE WITH LTHC AND THOSE WITHOUT

IMD quintile		High Food Security	Marginal Food Security	Low Food Security	Very Low Food Security
Most disadvantaged IMD	1	0.65	0.93	2.10	2.45
	2	0.85	0.62	1.87	3.79
	3	0.91	0.91	1.62	1.77
	4	0.95	1.16	0.98	1.82
Least Disadvantaged IMD	5	0.90	1.51	1.28	2.32
All areas		0.84	0.99	1.77	2.56

There is a slightly larger proportion living in the most deprived quintile (22.4%) compared to the least deprived (17.6%). Those who are living with LTHC are more likely to experience food insecurity compared to those who do not have an LTHC. The table below expresses this as risk ratios. People who are disabled are 2.56 times more likely to have very low food security and 1.77 times more likely to have low food security, regardless of where they live. Those with disabilities living in the most disadvantaged IMD areas compared to those without disabilities living in these areas are 2/3 as likely to have high food security. As the levels of disadvantage decrease, the ratios remain lower for those who have disabilities improve but remain lower compared to those without disabilities.

Having an LTHC does not necessarily mean, however, that a person's general health is bad. For example, 52% of people with LTHC indicated their health was good or very good, and 35% indicated their health was fair. Importantly, a very small percentage of those who do not have long-term health conditions, less than 1%, indicated that their health was poor or very poor.

Poor health, regardless of one's longer-term health, is a stronger risk factor for food insecurity. People with poor or very poor health are six times more likely to experience very low food security compared to those whose health is good or very good. Whereas those with fair health are two times more likely to experience very low food security compared to those whose health is good or very good. Poor diet contributes to poor health outcomes, as

established by the literature. Those who are food insecure are also known to struggle to achieve healthy diets. Two out of every five adults in the most deprived IMD areas ate three or fewer portions of fruit and/or vegetables the previous day in those areas that are most deprived compared to one out of every three in the least deprived areas.

What are people doing?

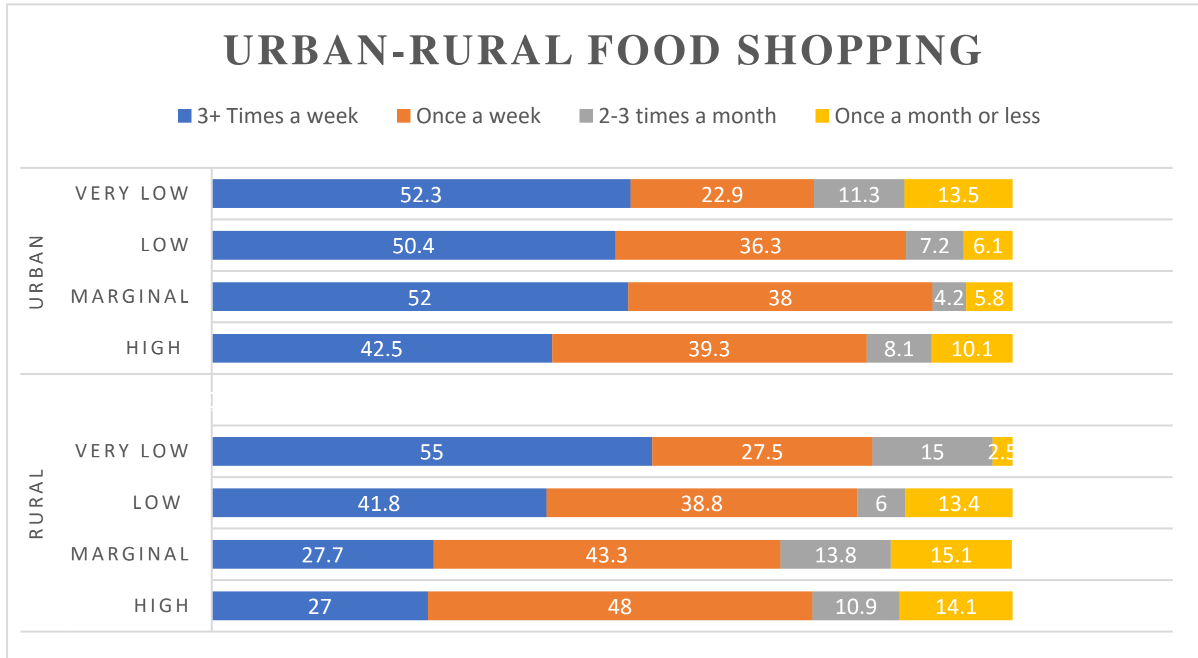
In this final section of this part of the report, our analysis focuses on what the government data say people are doing. There is scant data to analyse for this section, and at present, there are only questions in the survey indicating what people are doing regarding shopping and the use of free emergency food from a food bank. Latter waves will have questions focusing on the use of pantries. There is a question regarding what children in the household are doing. Still, given the small sample size, this Food and You 2 data are not the most useful for understanding uptake or acceptability and reach. There may be other data sources that provide further detail. We also do not have a sense of the use of voucher schemes or social eating activities that people may attend and receive meals from in this data.

Use of supermarkets, including mini markets

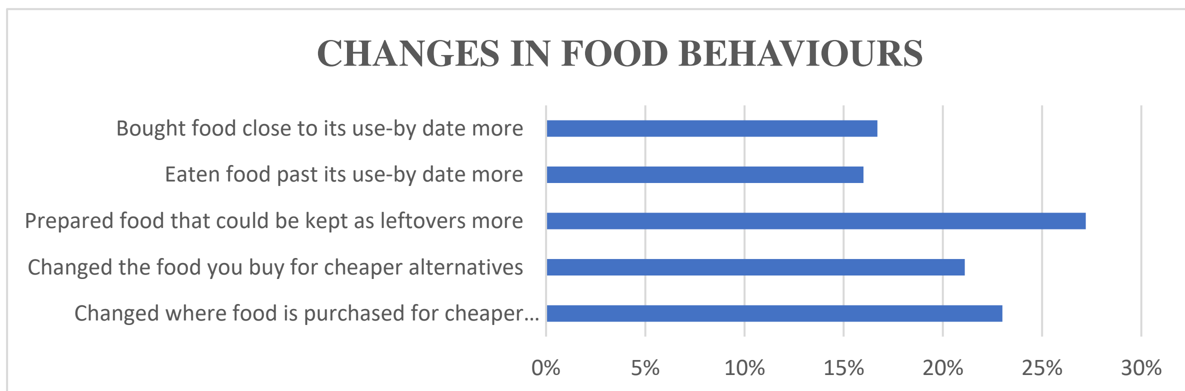
Most of the households in the survey used a supermarket or mini market at least some of the time (approximately 98% of all people). There is not enough detail in the data to understand what those who do not use these outlets are doing.

Most adults, regardless of levels of food security, tend to shop once a week or more frequently. However, those who are more food insecure are more likely to shop once a week, while those who are less secure shop more frequently.

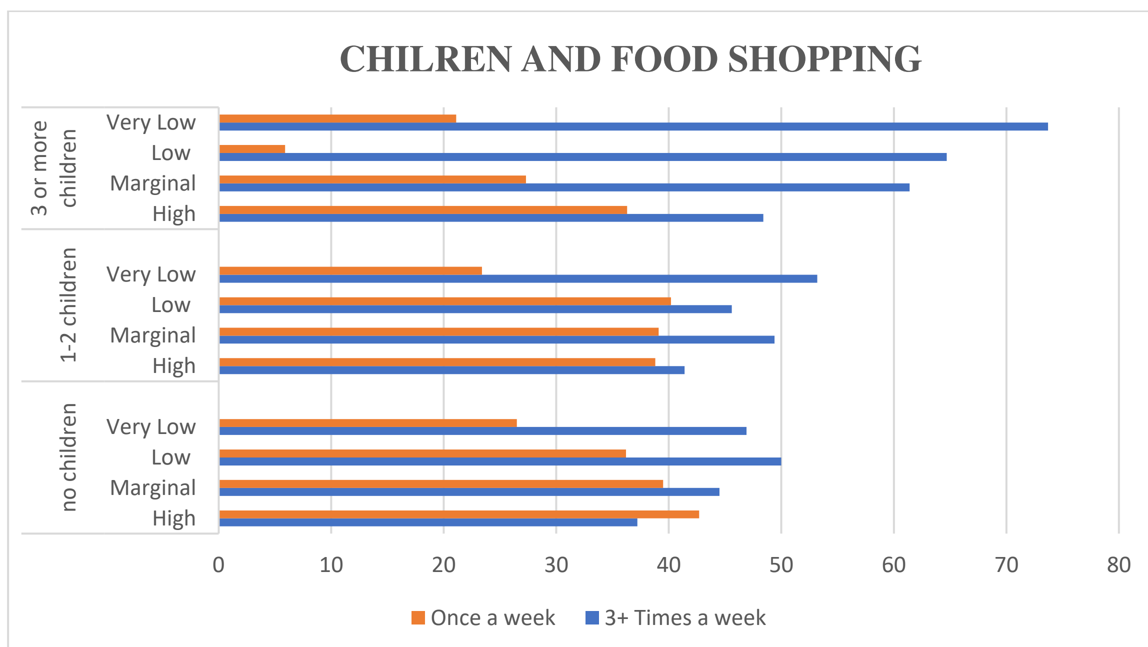
The index of multiple deprivation quintile does not make a large difference to these patterns, however, there are some differences when we compare urban and rural residents. Those living with high food security in rural areas are more likely to shop much more infrequently compared to urban residents. However, frequent shopping is the greatest among those living in rural places with the lowest levels of food security.



Changes in food behaviours were incorporated into household strategies by many. The data indicates that people are trading down in terms of food items and trading to what they perceive are less expensive stores. One in six shoppers was purchasing food very close to the use-by date, suggesting that the yellow stickers are an important strategy for stretching household budgets. While the survey asks about the understanding of different date labels, it only asks about people's willingness to eat food after the use-by date. There is some evidence that worries about becoming ill is a deterrent for people to eat food after its best-before date. Removing or changing sell-by dates could be more reassuring for people who are purchasing discounted food when there is not a linked food safety issue.



The data identifies that adults with children who have low or very low food security, shopping at a supermarket or small format shop is frequent, particularly among those who have three or more children. Only those with no children, who have high food security do a weekly shop as their most frequent mode of household food purchasing.



Qualitative research indicates that regular shopping is a strategy used to make food budgets last because buying meals daily allows the shopper to take advantage of yellow-sticker food and other deals in the shop. It also means that there is no temptation to eat tomorrow's food today and then have nothing tomorrow (Blake 2018). Many of these households will also be reliant on walking or taking public transport to shop for food, and they will live in housing with limited food storage areas. The outcome is that they can only purchase what they can carry and then store it once they get home, necessitating more frequent shops.

When I interviewed people in Doncaster about what they would like to see in their area, they said that they would like the value ranges available in the small format shops, which was all that was in their area. They would also like to see a wider range of frozen items and tinned goods to make meals (e.g., vegetables compared to ready meals). These interventions are something that supermarket chains could consider in these smaller stores. Additionally, finding ways to provide lower-cost, smaller serving amounts would be a very helpful addition for these households. Food buying clubs may also be a way to support those struggling or worried about their food security, as may discount on individual items or groups of items that can be used to make a meal.

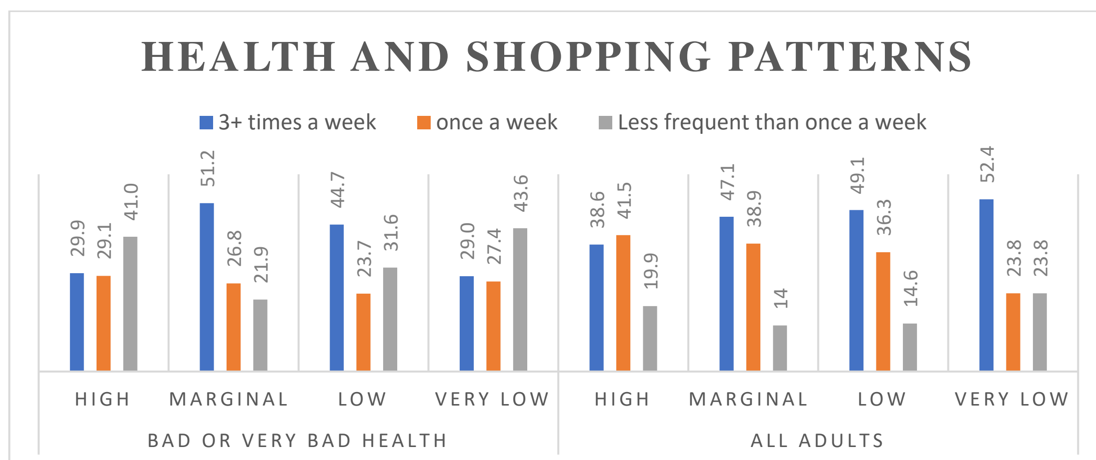
The "other ethnicity" group shops more frequently compared to the whole UK population, as indicated in the graph below. Many will eat according to traditional foodways and may struggle to find these in the small format, large chain shops.

Among the white group, who generally eat fewer fruit and vegetables (the group average is 29% eating five or more portions a day), the rates are lower for those who have low or very low food security. Just one-fifth (20%) of those with low food security and a similar figure (22%) of those with very low food security are eating five or more portions a day. This compares to 31.5% of those in the white category who are food secure.

Fruit and vegetable consumption among the other ethnic group tends to be higher compared to the national average. Just under two-fifths (39.8%) of the other category, compared to under one-third (29.1%) of the white category, eat more than five portions of fruit and

vegetables daily. Food insecurity is related to a reduction in fruit and vegetable consumption for this group. A large proportion, 43.2%, of those who are food secure in the other group eat more than five fruit and veg servings per day. This rate drops to just under 29% for those in low or very low food security and 39% for those in marginal food security. This pattern indicates that shifts from healthier to less healthy diets are linked to food insecurity for the other group. Finding ways to stretch budgets and bring more fruit and vegetables into neighbourhoods, especially outside of London, is needed. There is some evidence in Bradford, from the Fresh Street voucher schemes trial, that providing a mobile vegetable vendor can help fill this gap for this group.

Those who report very poor health also have different shopping patterns compared to the general population. This group is more likely to shop less than once a week overall. Those with very low food security are the most likely to shop very infrequently. Food secure people with poor or very poor health can overcome mobility-access issues by utilising delivery services. It is likely, however, that the food insecure find delivery unaffordable. Despite their poor health, the marginally food secure and those with low food security shop more than weekly. Interventions that consider the costs and other barriers this group may face in getting food home and when they are shopping would assist them to be more food secure.



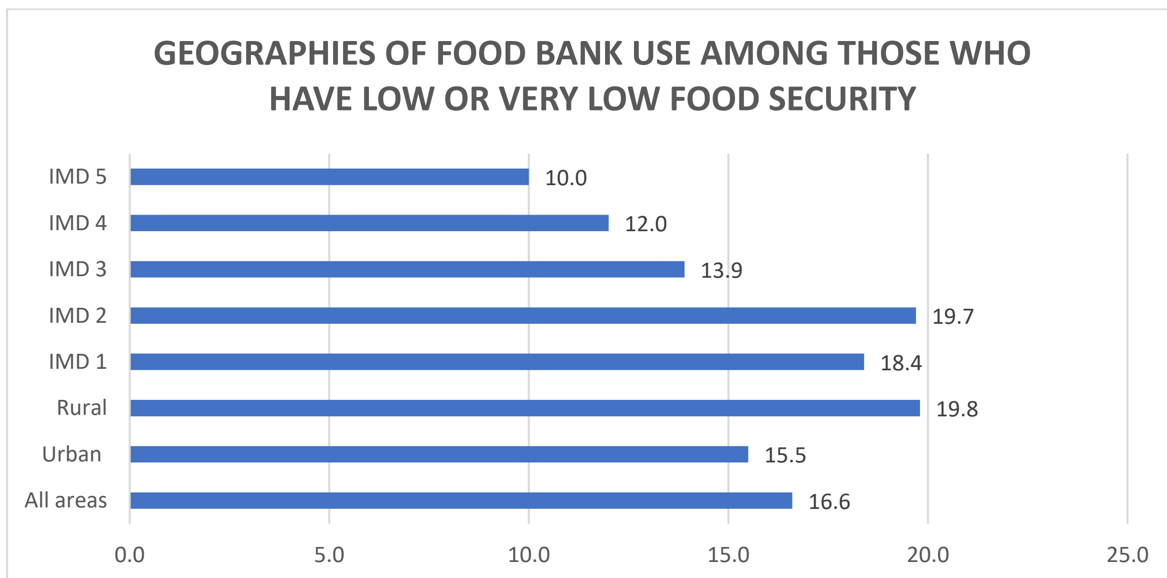
Shopping patterns and practices are disrupted for those who are food insecure. For those who have children or are in the other ethnicity category, frequent shopping and dietary patterns that contain fewer portions of fruit and vegetables are strategies that are being used by these populations. For those who are in poor health, the sample sizes are not sufficient to indicate changes to fruit and veg consumption, but less frequent shopping is a strategy that they use. More research on shopping and food insecure populations in the UK is needed to tease out the nuances of the strategies that people are employing as well as the barriers that they are facing that shape their abilities to eat well.

Food Security and Food Bank Use

What is abundantly clear from the evidence is that the number of people who access food banks is not equal to the number of people who would qualify for emergency food parcels. Of the approximately 48.9 million adults in England, Wales, and Northern Ireland, 15.2% experienced low or very low food security in the year before the wave 3 survey. This equates to about 7.4 million people. Of these, just 16.6% or 1.2 million adults lived in a household that had received a free food parcel in the previous year.

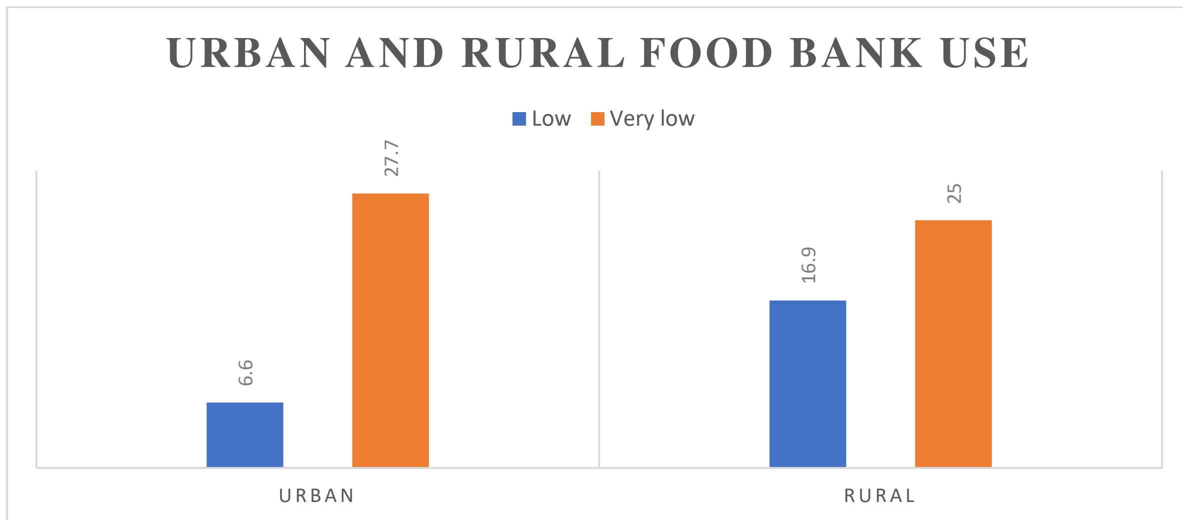
Those who have low or very low food security are generally screened for by the food banks. Some food banks require people to demonstrate they are in the very low food security category before receiving food support. Others (primarily independent food banks) are more flexible in their criteria, allowing self-referral, for example. Nevertheless, just 28.4% of all people who have very low food security and 8% of those with low food security accessed a food bank. When those with low and very low food security are combined, the take-up is only 16.6% (approximately 58.6% of these have low food security, and 41.4% have very low food security). The lack of take-up could be because they use other options not identified in the survey (e.g., pantries, soup kitchens, social eating venues, friends, or family), they do not have access to a food bank in their area at the time when they can use it, or they choose not to use a food bank because of stigma. All are evidenced as reasons from previous qualitative research, but we do not know which are the most common drivers of use and non-use.

The remainder of this discussion combines people with low or very low food security to examine variations in the take-up of emergency food parcels.

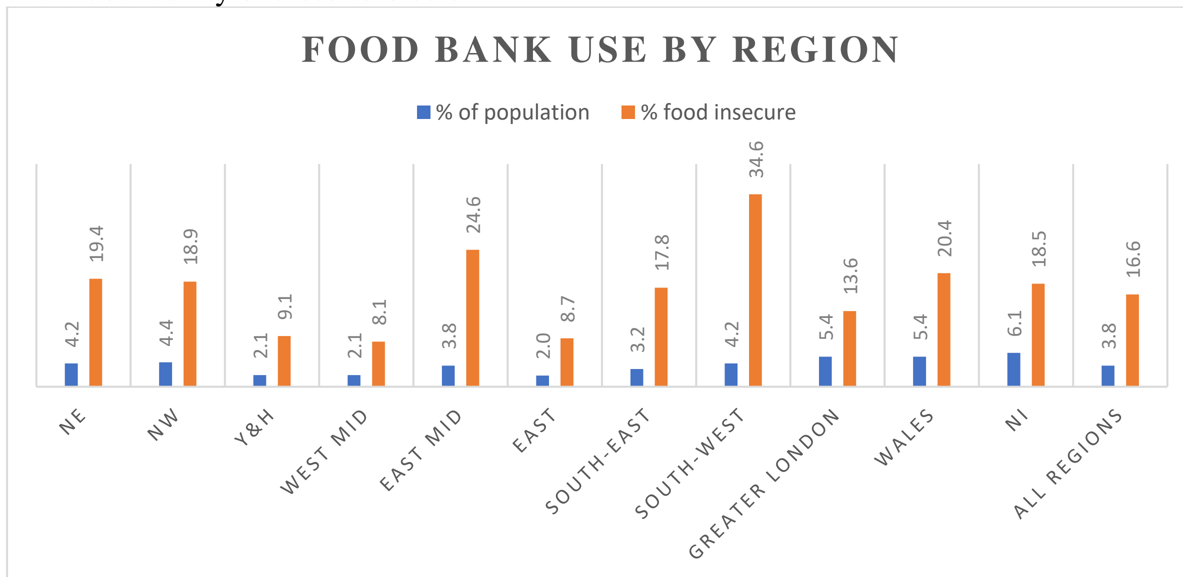


The type of locality influences food bank use, as shown in the table above. As deprivation decreases, so does the percentage of adults who access food banks. Interestingly, those who live in IMD 2 areas and those living in rural areas have the highest rates of food bank use. It is unclear why rates would be higher in IMD 2 areas compared to IMD 1 areas. This may be linked to supply-driven food bank provision, whereby food banks appear in places where volunteers and organisers are willing and able to provide these services. It may be that some higher IMD areas are less able to supply these services because of a lack of community cohesion to organise such a service and a lack of local resources (e.g., community centres) within which to hold them.

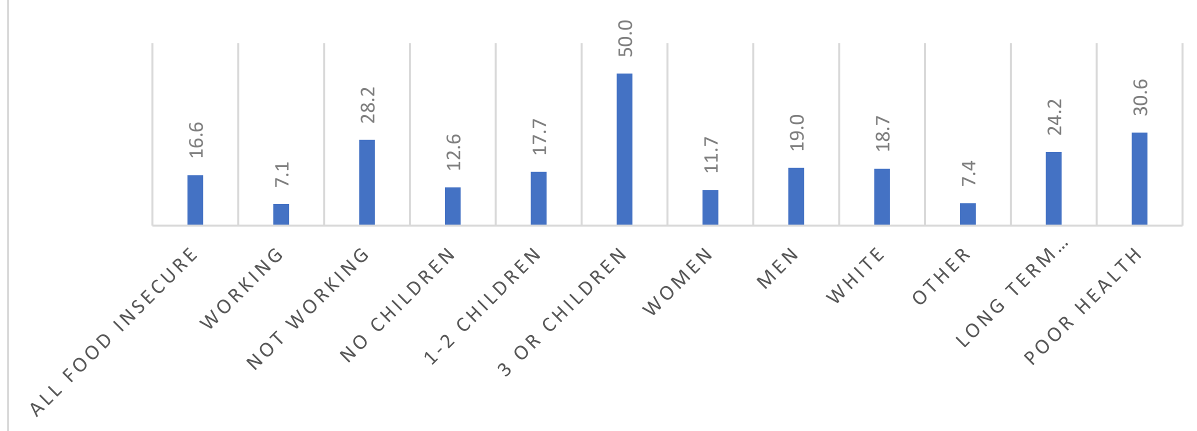
The differences between urban and rural food bank use is also not entirely clear. However, when urban and rural food bank use among the low and very low food security is disaggregated the figures show that for urban places food bank use is skewed toward those with very low food security (27.7%) compared to those with low food security (6.6%). In rural areas, however, the percentage of people accessing food support who have low food security rises (16.9%) and the rates of use among the very low food secure group drops slightly (25%). The reasons for this may be due to the levels of local demand in rural areas enables a wider group of people to access that support. Lower use among urban low food security adults may also be linked to barriers that certain food bank providers put in place that require a referral. There may also be other opportunities to access food in urban places for those who have low food security compared to rural localities, which people prefer to use. On the other hand, some rural food bank providers offer delivery of parcels to rural residents, which reduces the stigma of having to collect directly from the foodbank itself. This is frequently not an option in urban areas.



The proportion of people eligible to use a food bank but do not is also variable across regions. The areas where the greatest proportion of the total population use a foodbank include Northern Ireland (6.1%), Wales (5.4%) and Greater London (5.4%). However, these are not the areas where use is highest among the food insecure (including low and very low) population. The highest rates of use among the food insecure are in the Southwest (34.6%), the East Midlands (24.6%), followed by Wales (10.4%). It is unclear if these differences in use are linked to different ways that the services are delivered in these areas or if it is linked to the availability of these services.



The use of a foodbank also varies by group of people. Those who are food insecure (those with low or very low food security) and who are most likely to use a foodbank are people with three or more children (50%) followed by those with poor health (30%). Those least likely to access a foodbank are those food insecure adults who are working (7.1%) or those in the other ethnic category (7.4%).



There is some concern among foodbank providers that those who do not qualify for food bank support are using them or are using multiple food banks. The table above does not suggest that this is the case. Even for those who are more food secure for financial reasons, there may be other drivers such as an inability to utilise food (e.g., poor health, lack of cooking equipment/space to cook, poor cooking skills), or lack of local availability of food that may be the drivers for their use.

A likely reason for the higher rate of foodbank use among those with three or more children is that adults will skip meals and cut back in other ways first, but they are unwilling to sacrifice the comfort of their children. This was evident in a recent survey by The Bread and Butter Thing, a food club, where member households were asked about their heating use. Households *without* children were much more likely to turn the heat off and put on another coat or blanket than those with children.

Those in the other ethnic group living with low food security were less likely than the white population to access a foodbank. This could be driven by which groups are more likely to set up food banks (churches), cultural traditions and religious practices (e.g., food sharing among certain ethnic groups), and the lack of suitable food to meet religious needs and dietary traditions.

It is unclear why those who are working but still food insecure are not accessing food bank support or are doing so at a very low rate. It may be because the food banks are closed when those in this group may be able to access them, because of perceptions held by those who provide referrals that this group doesn't qualify for this help, or the stigma associated with accessing a foodbank and shame at being employed but still needing help.

While we do not have a clear understanding of why people do not use food banks, despite not being food secure. Qualitative research suggests this could be for reasons of stigma, lack of access to a food bank, or other available sources of food. This ambiguity regarding people's motivations for not using a foodbank does not mean that more food banks are necessarily desirable. If stigma and reluctance are the strongest underlying factors for non-use, other solutions may be more acceptable to those who would benefit from support. Existing alternatives are explored in our literature analysis on these different forms of food activity.

Types of interventions and intervention studies

Interventions used in the UK to address community food insecurity among low-income populations include free food parcels as would be received via a foodbank, food clubs, cooking activities, and social eating activities including soup kitchens but also community meals. There are also voucher schemes, some directed at families with children and others that are place-based. Appendix B provides a summary table of interventions operating in the United Kingdom. Appendix C provides a table for comparing the impacts of the different types of interventions.

The UK government funds several specific schemes that target children. These include Free School meals for households after tax, but before benefits earnings are less than £7,400. In England, all children in year 1 or 2 receive free school meals regardless of income. These are funded through the government and delivered by schools or through local authority-coordinated community delivery in collaboration with schools and other existing community infrastructure.

The existing evidence suggests that no single intervention will solve food insecurity nor repair all its effects on individuals, households, and communities. Each type of intervention has a role to play in the current and what will be an exaggerated future context. We need to continue to support those who have reached very low food security and need free food. What is also clear in the evidence from the quantitative part of this study and the research on interventions below is that much more investment is needed to ensure that people in more localities can access food support that targets people who are located within the marginal and low food security categories. For the subset of people who are not confident cooks, cookery lessons prepared meals, and social eating may also be useful interventions. Likewise, prepared meals and social eating will be useful for those who struggle physically to cook for themselves as ready meals can be used with a microwave, and social eating provides hot meals and an opportunity to socialise.

There has been little systematic evaluation of food security activities to determine their effectiveness for reducing food insecurity, improving health outcomes, increasing uptake of fruit and vegetables, or increasing well-being and social connections. Free food parcels have been the most frequently studied, with findings concerning stigma and critiques of the charity model as a failure of the state being most prevalent (Cloke et al 2017). Three are a small number of studies of US foodbanks which sit between the foodbanks and food club models we see here in the UK. There are a few US and Canadian studies that do not evaluate these free food programmes directly but instead focus on additional food-linked services, primarily to do with health outcomes, which are included in this review as additional services as they could be attached to either a UK food bank or a food club scheme. There is also a small amount of evaluation of social eating activity, not systematically reviewed, and ongoing evaluation of various voucher schemes, which we report on.

The other model studied somewhat more but still is under-evaluated is holiday activities. As a result of these studies and campaigning by various groups in the UK, devolved governments are funding local areas to provide activities and meals for children during the long school breaks. In England, these are referred to as the Holiday Activities Fund. These are not evaluated in this report as the programme started in 2021 as a trial with a wider rollout in 2022. Evaluations are ongoing.

Food Ladders as a way of framing food activity

Research by Blake identifies different types of food support activity operating at the community scale and provides a framework for understanding what those different activities enable. Known as the Food Ladders framework and drawn from resilience theory and community development literature the underpinning of the framework structure seeks to identify what capabilities each form of intervention type foster across different levels of food security as they link to the four pillars. The interventions explored in the research focus on food availability and utilisation, social aspects linked to community and individual well-being, and food economies. More recently, a physical health ladder has been added to the framework, and other ladders could be developed depending on focus (e.g., environmental sustainability).

Broadly there are three rungs on each ladder. The first rung is catching activity. This is typically crisis support that seeks to provide immediate emergency support. These are typically interventions underpinned by charity and emphasise deficit, need and want and which seek solutions that address that immediate need once it is established. The second rung is capacity building. These interventions aim to prevent deepening need or crises and seek to enhance resources (social and physical capital), and help people learn skills that will enable them to be less vulnerable to food insecurity. The third rung is transformative activity that eliminates vulnerability or enables people to have the capability to achieve and remain food secure. The table below illustrates these four ladders and the three rungs.

	Catching	Capacity building	Transforming
Food	Emergency support: Food parcel, soup kitchen	Activities that expand food literacy,. E.g., cooking lessons, pantry schemes that expose people to new food items, children's food literacy.	Activities that diversify the foodscape to meet all local food needs and/or create positive relationships with food.
Social	Mental health support, befriending groups, resilience networks	Regular activities that bring people together to develop meaningful social networks. Breakfast clubs, afterschool clubs, craft sessions, social eating, and pantry schemes.	Self-organized activity, Social ties that look out for each other.

Economic	Free food to meet basic needs, crisis support. Signposting to services e.g., housing, welfare	Interventions that: stretch budgets, enable the practice of thrift, build financial literacy, improve credit (e.g., micro-loans), and increase employability and business skills development. Subsidies to create demand to help markets get established. Business incubators and start-up grants. Micro-enterprise incubators.	Local procurement and community growing develop markets, create demand, creates local profit and employment opportunity, and activity that brings economic sustainability to an area.
Health	Medication/Medical intervention. Vouchers for fruit and vegetables. Prescription fruit and veg.	Interventions that provide health information, exercise and or movement, and social prescribing activities, such as gardening. Nutritional literacy. Interventions with retailers to shift toward healthier food.	School food procurement to achieve health and welfare standards. Use of planning and council tax levers to enhance foodscapes.

Importantly one intervention activity can sit at different levels on each of the ladders depending upon how it is configured.

Currently, several places, frequently in collaboration with local government or driven by local government, are utilising the food ladders framework to map service availability and find ways to fill the gaps within their food landscapes. In many areas, people can access either a food bank or a supermarket. Still, there may be little support that bridges the gap between the two while also seeking to enhance resources and capabilities while reducing vulnerability and dependence. A further key aspect of intervention success must be the acceptability of the intervention by those who are its intended beneficiaries. The next sections identify different forms of food support and outlines existing research.

Free food parcels

There are no intervention studies that we could find that evaluate the impact of introducing a free food parcel into a community and measuring the effects against a control group. We also could find no studies that systematically collected data before the intervention and then measured change over time.

Free food parcels are a lifeline for those severely food insecure. When used alone, they cannot eliminate their users' heightened food insecurity (Cloke et al 2016, Loopstra et al 2015, Oldroyd et al., 2021) and do not prevent people from reaching very low food insecurity in the first place (Blake 2018). A recent mixed systematic review of 11 quantitative and ten qualitative studies on the nutritional quality of food parcels and the effectiveness of food banks at reducing food insecurity in developed countries reveals that despite food

pantries/banks improving food security, food insecurity remained. It is explained by limited food variety, quality, and choice and calls for interventions to ensure consistent, adequate nutrition at food banks, including catering for individual needs (Oldroyd et al., 2021). A similar systematic review of 15 articles by Eicher-Miller (2020) on food security, diet, and health outcomes of food pantry clients among adult foodbank (pantry) users in the US concluded that food insecurity and very low food security among food pantry clients are higher than national estimates at up to 89% and 52%, respectively.

In the UK, food banks[1] offering free food parcels generally supply a three-day supply of ambient food items. Nutrition studies on US based pantries that tend to provide a wider variety of foods, including fresh items, found that the supply of these was not consistent. (Caspi et al 2021). Recent systematic reviews on the quality of dietary intake of US food pantries users reveal that the diet quality among food pantry users was low - inadequate means group intake of energy, fruits and vegetables, dairy products, and calcium; and were inconsistent at meeting nutritional requirements and often failed to meet individual needs, including cultural and health preferences (Oldroyd et al., 2021; Caspi et al., 2021; Eicher-Miller, 2020; Bryan et al., 2019; Simmet et al., 2017a; Simmet et al., 2017b). The review by Eicher-Miller (2020) found that dietary quality was up to 20 points lower on the Healthy Eating Index compared with U.S. adults; Intake for 16 nutrients did not meet the Estimated Average Requirement or exceeded the Average Intake for 30% to 100% of clients. Simmet et al. (2017a) study showed that even if the group mean intake was adequate, large percentages of study populations did not meet the recommendations for vitamins A, C, D, and B, or iron, magnesium, and zinc. Moreover, there are significant variations in the supply of energy, food groups, and nutrients provided by food pantries (Bryan et al., 2019; Simmet et al., 2017b). Simmet et al. (2017b) concluded that while dairy products were one of the most common foods that supply was inadequate for some interventions, the amounts of fruits and vegetables that were provided were inadequate. Thus, food pantries could not provide amounts and types of foods that were adequate for a balanced diet for the days the food bags were declared to last (Simmet et al., 2017b).

The literature also identifies several further social barriers to food bank use. Cultural barriers include language, culturally appropriate foods, and lack of cultural understanding between users and volunteers (Byrne and Just, 2022; Remley et al., 2010; Fong et al., 2016). Stigmatisation poses barriers to food pantries and pantry usage. A recent review by Middleton et al. (2018) on the experiences and perceptions among food bank and pantry users in high-income countries showed issues of feelings of awkwardness, shame, humiliation, and embarrassment when using food pantries in the US, Canada, New Zealand, the Netherlands, and the UK. Reducing stigma is an area actively being addressed by many food banks and food pantries (Martin, 2021).

UK Food clubs and pantries

Emergency food parcels and food banks have been associated with poor quality and stigmatisation. To overcome these issues, alternative community food projects have focused

[1] Note that in the food pantry model in the United States differs from the UK foodbank in that free supplies of fresh fruit and vegetables, meat, fish and other store-cupboard items are included in the parcel, similar to what might be found from a social supermarket or a discount food scheme or what we call a pantry. They are unlike the UK style pantry schemes in that they target those who have very low food security and recipients must demonstrate need, the food is free, they do not have opportunities to volunteer, and the bags of groceries are intended to be the primary source of food.

on accessing and redistributing surplus food from the food industry to those who are food insecure, but not necessarily those with very low food security.

Most food clubs and pantries offer more than low-cost food, with food used as the starting point and the end destination to address food insecurity. These interventions included wrap-around services – either providing these services in-house or working with other community agencies, or connecting users and participants to the right services. The available evidence - either peer-reviewed or evaluation of the project's impact showed that the community interventions improve access to good quality foods, has the potential to reduce food insecurity and hunger among food insecure population, improved diet and nutritional knowledge and cooking skills, improves health outcomes (physical, mental/emotional), and improves social and financial wellbeing of users or members. There are potential benefits to the community through these intervention projects -in terms of building community resilience and social infrastructure, which reduces isolation and loneliness, investment in the communities and connecting community services.

These interventions offer access to residents in a particular area and do not require referrals or demonstration of need. Although these interventions increase overall access to food for those vulnerable and food insecure and reduce food insecurity, it is unclear whether these programs eliminate long-term food insecurity - since food insecurity is a multifaceted issue – is not only about access and availability but also usability and stability. There were no studies identified that examined the long-term impact of interventions in eliminating food insecurity in its entirety. Although, an evaluation report by one of the food hubs interventions (The Bread-and-Butter Thing - TBBT) reported that 16% of members (3760 people) have stopped using food banks entirely since joining TBBT. While a further 1420 members (6%) have managed to reduce their foodbank use from 'often' to 'sometimes'.

Impacts report of the membership-based pantries and food hub projects reported financial savings for their users. For example, the community shop reported that members save an average of £212 each month on their shopping bills, and together members saved over £7.5 million in 2021 alone. While YLP impact report showed that a typical food basket at a pantry is worth over £20, saving members at least £15 each visit. For households that visit the Pantry each week, they can save at least £780 per year. And TBBT report indicated that collectively members saved £2.9 million, with 79% of members indicating that the income leftover to purchase more than the basics.

Cooking lessons

Cooking skills, nutritional knowledge, and resources – including financial, transportation, and cooking appliances/storage have been identified as potential barriers that limit one's ability to make use of pantries (Caspi et al., 2017; Dave et al., 2017; Flynn et al., 2013; McLaughlin et al., 2003). Cookery lessons, sometimes referred to in the UK as cook-alongs or cook and eats seek to address skills shortages and the food knowledge of people who are food secure. Most review of cooking lessons concerns the interventions provided by Bags of Taste and are either self-evaluations with clients (Bags of Taste 2019, 2020) or external evaluations (Lasko-Skinner and Jeyabraba 2021, Norris, O'Mara and McLeish 2020, Purdham and Silver 2020). Bag of Taste project reported 79% of participants report saving money on food bills & takeaways, which typical savings equate to £1,350 a year.

The evidence reviewed shows that Bags of Taste lessons substantially improve food security for the members and users due to increased access to food. For example, the cooking on

budget intervention project (Bag of Taste), which teach participants cooking skills and how to source local cheap food to prepare a healthy meal for £1 improve their long-term access to food. Bags of Taste project (Bags of Taste) reported increased vegetable consumption (38%) with 85% of participants buying less take away; 84% of participants learnt about healthy eating and long-term dietary and behaviour change – 90% of participants cooked one or more of the recipes at least twice at home (Bags of Taste, 2021).

The review found increased confidence in the kitchen and around food increasing cooking skills. More than a third (38%) of Bags of Taste participants of users reported an increase in cooking skills, while 86% reported savings on food bills and 71% wasted less food after the course. An intervention trial study of cooking and nutritional education found improved cooking skills – 75% stated that after the classes, they felt more confident about cooking healthily on a budget. While 72% of participants also stated that their confidence in cooking had either "improved" or "greatly improved, but 28% of participants felt that their confidence levels had "stayed the same (Purdam and Silver (2020). In the intervention study, 65% of participants said they learned to use new ingredients (Purdam and Silver, 2020). The study also reported potential long-term impact – beyond cooking and food budgeting skills 84% of participants said they would "cook the recipe again. While 80% of the participants stated that they would share the skills they had learnt with family and friends. The increase in self-confidence and self-worth resulted in more participants volunteering in the community (Bags of Taste, 2021) and participants who were keen in cooking for other people were signposted to more advanced food preparation and cooking courses at local colleges (Purdam and Silver, 2020).

However, not all people with food insecurity struggle with cookery skills. In a survey with The Bread and Butter Thing participants, only 26% (n=2130) indicated that they felt they had low or very low cooking skills, whilst 20% indicated that they were very confident skills (Blake 2022).

Social Eating

Social eating activities include eating a cooked meal together in a particular location. These range from soup kitchens that target usually the homeless to activities that specifically work to attract a wider group of people. There are social eating networks across the country and there is also a history of such venues being active during the Second World War and into the 1970s, known as British Restaurants (Evans 2019). Food Cycle and the Nottingham Social Eating Network are examples of modern-day versions and are active in several locations within the United Kingdom. While the original British Restaurants emerged out of largely religious community-based initiatives in locations across the country, during the Second World War the government created a network of state-subsidised British Kitchens (Evans 2019). These interventions ensured that hot nutritional food was available at a low price.

Focusing on current models of these latter types of social eating, Marovelli (2019) found that social isolation and loneliness as central drivers for participating in food-sharing initiatives across London. Several of the studies reviewed – both quantitative and qualitative point to the importance of the community intervention project in building social infrastructure and community resilience. Most interventions require working with community partners to establish the hubs to create community resilience and social infrastructure for members and the community. The collective spaces provided the interventions and the affective qualities that they generate are particularly vital in urban contexts in times of austerity, as these initiatives can embrace social differences and to facilitate the circulation of ideas and practices of care and hospitality. They operate as provisional bridging mechanisms between

people, communities, projects, and services, providing the connective tissue in ways which are hard to measure through simple quantitative measures and, as a result, are rarely articulated (Marovelli, 2019; Blake 2019).

In addition to providing opportunities for commensality, these interventions have the potential to provide accessible hot meals to people who may struggle to cook for themselves because of physical limitations, limitations in terms of having the necessary skills or equipment or being able to afford the fuel needed, or the motivation to cook. Not all people, however, are comfortable or have the time or desire to eat communally and so these interventions will not appeal or be available to everyone.

Ready Meals

There are a number of smaller-scale providers who prepare meals that can be taken home and microwaved. Can Cook Kitchen in Liverpool and North Wales and Food Works in Sheffield are two examples. The meals are prepared and distributed either via a shop or network of community spaces or via a mobile shop. Those accessing the meals are allowed to choose from a range of items that they purchase for a moderate amount of money. Food works charges £1 per meal. Can Cook do a Well Fed at home range delivered directly at no additional cost although these are quite expensive. The prices per meal from the back of the van are £2 per meal, £4 for a slow Cooker Bag to cook at home, and £1 for a breakfast pot. These meals are claimed to be healthier compared to supermarket processed foods. Take-home meals are probably a very good option for people who struggle to cook, are unable to use the cooker because of health limitations or cost, or who live alone. While the Food Works meals are sufficiently affordable for people with tight incomes, it is unlikely that anything more than £1 will fit into household budgets. There is no evidence to show that beyond eating more healthily these initiatives are addressing cooking skills shortages or increasing social interactions. There is no independent evaluation or controlled trials available for these interventions.

Vouchers

Voucher schemes provide food vouchers to specific groups of people to enable them to access healthy food. There are both government-run schemes like the Healthy Start Vouchers – England (pregnant women and families with children under four years) and the best start food scheme in Scotland; and Charity funded food voucher schemes like the Alexander Rose Voucher Scheme and Research funded projects like Fresh Street Voucher Scheme.

In the UK, the Department of Health and Social Care 'Healthy Start program provides £3.10 per week for fruit, vegetables, milk and infant formula (Healthy Start 2022). The programme targets low-income pregnant women and mothers with children under four who are on income support. Purdam and Silver (2020) report that 65% of respondents using healthy start felt that they would eat more healthily because of receiving the vouchers.

Uptake data indicate that less than half of eligible mothers are accessing the programme (Department of Health and Social Care 2020). There is some indication from the literature that these declines are linked to the stigma associated with having to use papers at the supermarket (McFadden et al 2014). Early in 2022, adjustments were made to the scheme that increased the value of the vouchers to $4.24 onto a prepayment card, equivalent to four weeks of entitlement. The advantages of these changes are that they reduce the stigma associated with paper vouchers and people can carry over expenditure from one shop to the next. There have been problems with the digital system, with people reporting being declined

at the checkout. Comments on the Healthy Start Facebook page suggest that there continues to be confusion around how to use the scheme, eligibility, and getting approved.

The Alexandra Rose Charity offers Rose Vouchers for Fruit & Veg. The scheme aims to help families on low incomes to buy fresh fruit and vegetables and supports them to “give their children the healthiest possible start” and promote healthy eating. The vouchers are intended to top up or provide additional buying power to those who qualify for the Healthy Start Scheme run by the government. Rose Vouchers add another £3 for each child every week or £6 if the child is under one year old. Unlike Healthy Start Vouchers, which can be used at large retailers, Rose Vouchers are paper vouchers and can only be used at local greengrocers or markets and can only be used for fruit and vegetables. Vouchers are accessed through participating children’s centres; however, austerity has meant that many children’s centres have closed so this scheme is only available in eight locations across the UK including Barnsley, Glasgow, Hackney, Hammersmith and Fulham, Lambeth, Liverpool, Southwark and Tower Hamlets. In Liverpool, a mobile shop goes to areas where fruit and vegetables are not available.

The Fresh Street scheme is an ongoing intervention research programme. The intervention includes a weekly envelope containing five £1vouchers that can be spent at a partnering fruit and vegetable shop or market stall and a weekly flier with healthy eating tips and a recipe for making a seasonal meal with fresh produce. The vouchers can only be spent on fruit and vegetables. Vouchers are offered to all residents in an area regardless of income but are targeted and located within the IMD 1 quintile. Early results from the trial indicate that most households offered the scheme (80/90, 83%), and 89.3% (17,849/19,982) of vouchers issued were redeemed. Householders reported that the scheme made them think about what they were eating and prompted them to buy more fruits and vegetables. Some participants responded that their diets had changed and that they could eat more healthily and lose weight (Relton et al 2022).

The Fresh Street vouchers, like Alexandra Rose, can only be used with partner retailers who sell fruit and vegetables. These are local fruit and vegetable shops or vendors. The study investigators hypothesise that this limitation will keep money locally and the vouchers will stabilise the demand for these vendors helping them to be economically sustainable. There is some indication that this is occurring in the current wider scheme trials in Bradford. Because one of the intervention locations has no local fruit and vegetable provider, a local market trader provides a weekly mobile shop so people on the street can use their vouchers. Since this began, others from nearby streets started using the mobile shop to buy their fruit and vegetables even though they were not participating in the voucher scheme (Fresh Street management meeting minutes, July 2022).

There are benefits associated with these voucher schemes not associated with other types of interventions. When stigma is guarded against, purchasing is closest to a ‘normal’ retail experience and food variety, quality and access are not any different compared to what an average consumer who has high food security can purchase.

Additional services or modifications to food parcels

We found 20 control intervention studies, mostly conducted in the United States and Canada, that start with an existing free food service and then add a component to it to determine the effect that the addition has on participants. The control group were also participant in the service but did not receive the intervention (treatment). All 20 of the intervention studies

found the additions played a critical role and were effective in improving participants' diet-related outcomes. Significantly, the nutrition education and the client-choice intervention enhanced participants' nutrition knowledge, cooking skills, food security status and fresh produce intake (Eicher-Miller, 2020; An et al., 2019). The food display intervention helped pantry clients select healthier food items, whilst the diabetes management intervention reduced participants' glycaemic levels. Most of the interventions were modest in scale and had short follow-up duration (minimum follow-up durations were three weeks to as high as 72 weeks). Appendix B provides a summary of the scale of the intervention, design of the intervention, intervention components, outcomes/results, and effectiveness of the intervention.

Nutrition education (n 10) was the most common intervention, followed by client choice intervention (Freshplace) or novel food bank/food pantry interventions and diabetes management. The nutrition education interventions mainly included nutrition knowledge dissemination, for example, nutritional implications of different fat types, healthy eating plates, nutrition facts label use, the relationship between nutrition and health, and healthy recipes using fresh produce intervention and cooking demonstrations. In this intervention, local volunteers and extension staff provided education on nutrition-related facts and knowledge for low-income families. Staff and volunteers were trained on the relationship between nutrition-related food and chronic diseases (An et al., 2019).

The quantitative studies that applied statistical tests and models reported a statistically significant positive association between the food pantry/bank-based intervention and the food security or food stability status of participants (Rizvi et al., 2021; Enns, 2020; Cheyne et al., 2020; Seligman et al., 2018; Martin et al., 2016; Martin et al., 2013; Martin et al., 2012; Eicher-Miller et al., 2009). Remarkably, there were significant reductions in food insecurity for people who accessed food banks/pantries that offered a Choice model of food distribution and food banks that were integrated within the Community Resource Centre (CRC) compared with traditional food banks (Rizvi et al., 2021; Enns, 2020; Cheyne et al., 2020). Interestingly, accessing a food bank integrated within a community resource centre was significantly associated with reporting less severe food insecurity or a decrease in the proportion of people in the severely food insecure category at six months compared to baseline (Rizvi et al., 2021; Enns, 2020). Thus, pantries and food banks serving highly vulnerable communities can improve food security and nutrition (Cheyne et al., 2020).

The nutrition education interventions and the client-choice intervention were found to significantly improve participants' fresh produce intake (Enns, 2020; Caspi et al., 2019; Seligman et al., 2018; Caspi et al., 2017; Miyamoto et al., 2016; et al., 2013; Flynn et al., 2013; Yao et al., 2012; Eicher-Miller et al., 2009). The food display intervention and nudges were found to significantly help pantry clients select healthier food items. Even low-cost and unobtrusive nudges can be effective tools for food pantry organisers to encourage the selection of targeted foods. (Walch et al., 2022; Wilson et al. 2017). Notwithstanding, Caspi et al. (2019) SuperShelf intervention which focused on making healthy foods available to clients, concluded that while the intervention resulted in a more nutritious set of foods available to clients in food pantries but increasing healthy food availability alone appeared to be insufficient for changing client food selection. They argued that behavioural economics strategies that emphasise healthy foods and de-emphasise less healthy foods are well suited to be used in pantries ready to transform. On the other hand, diabetic interventions that include providing specific food packages resulted in the consumption of healthy diets - increased fruit and vegetable consumption compared to the control group (Cheyne et al., 2020; Seligman et

al., 2018; Seligman et al., 2015; Martin et al. 2013; Martin et al., 2012). Cheyne et al. (2020) reported a significant increase in the consumption of healthy food (green salads, nonfried vegetables, cooked beans, cooked whole grains, whole-grain foods, and fruits and vegetables) and a decrease in the consumption of unhealthy foods (high fats and sugar foods).

Increasing choice opportunity alone is not likely to increase the uptake of healthy options, although it is often the clients' top priority. SuperShelf intervention, which focused on making healthy foods available to clients concluded that while the intervention resulted in a more nutritious set of foods available to clients in food pantries but increasing healthy food availability alone appeared to be insufficient for changing client food selection (Caspi et al. 2019). However, studies that helped clients choose foods that were appropriate to their health and nutritional needs and provided additional knowledge-enhancing services were effective in improving the uptake of nutritional foods and for managing health conditions such as diabetes (Caspi et al 2019).

Conclusion and measures of intervention success

This report has shown that increasing numbers of people within the United Kingdom are being pulled into food insecurity since the small improvements that were obtained as COVID started to recede. Small changes in circumstances give rise to large numbers of people moving into and out of different levels of food security. The vulnerability to declines in food security are linked to locational conditions and characteristics alongside and intersecting with group circumstances. People move into and out of food insecurity as their individual, group, and locational circumstances change. A key measure, therefore, of intervention success is the degree to which people move toward higher levels of food security or are prevented from falling into deeper food security and is evidenced by changes in the responses to the questions that make up their food security score.

Food insecurity is fundamentally geographical. The IMD quintile area within which one lives is as important as national level effects on food security. In some instances, as demonstrated by the analysis, local conditions can enable resilience in the face of national shifts. In other circumstances, they add to the burden that people in those places experience. Interventions that make a difference in these local contexts are needed and their effectiveness can be judged by changes in the measures of food insecurity outlined in this report. These include reductions in very low, low, and moderate food insecurity as well as increases in overall food security attributable to local effects.

The analysis also demonstrated that those living in rural localities have unique circumstances pertaining to energy use and transportation that need to be taken into account for interventions to be successful in preventing insecurity and lifting people out of food insecurity.

There are also regional variations in the degree to which people living in different kinds of areas within those regions are pulled into food insecurity. In some regions, there are great divides between the security of those living in more affluent places and the insecurity of those living in less affluent localities. The success of interventions that target disadvantaged localities could be measured by the degree to which areas become more equitable such that overall rates of food insecurity are more closely aligned with rates in more affluent areas.

While those who are out of work or unemployed are most vulnerable to food insecurity, this analysis has shown that for many, employment, including full-time employment, is not a means by which they can avoid food insecurity. Interventions that reduce employment

transportation costs, help people stretch budgets, locate food near where they live, and improve wages are needed, particularly in areas of high deprivation. The effectiveness of these can be measured by reductions in the different levels of food insecurity by area type and go hand in hand with shifts in local effect scores.

While all groups are vulnerable to food security, particularly if they are located in areas of higher deprivation, certain groups are more vulnerable to food insecurity. In addition to targeting interventions in specific areas, interventions that target or accommodate the needs of households with children, particularly three children or more, BAME communities, people with long-term health conditions and people in poor health. Reductions in their disproportionate risk of food insecurity would be a clear measure of success.

This analysis has shown that food insecurity and the strategies people use are complex, intersecting with the conditions and characteristics of the places where they live, their working status, the presence or absence of children, ethnicity, and health. The analysis indicates that there is a relationship between shopping more frequently than once a week increases as food security levels decrease. While we do not fully understand the specific strategies people are using and the ways that they may be combining different food sources, this relationship suggests that a move toward a weekly supermarket shop is an indicator though not perfect, of improved food security. Similarly, intervention success may also include measures that demonstrate the use of food banks has declined or been eliminated among participant households.

This analysis also shows a correlation between fruit and vegetable uptake and food insecurity even among groups for whom fruit and vegetables are a large part of their normal dietary practices. Interventions that ensure fruit and vegetables are being made available and that people can afford, store, and utilise them are needed. This includes ensuring that quantities can be stored at home and that people understand what unfamiliar items are and how to cook them. Measures of the success of these interventions include increased daily consumption of fruit and vegetables.

The intervention research indicates that food banks are a lifeline for those with very low food security, but they do not provide adequate food or nutrition to meet recipients' needs. The analysis suggests, and qualitative research has shown, that stigma is often attached to food bank use. Qualitative research reveals the importance of how food projects are delivered has important implications for their acceptability. Thus, an important measure of the success of a programme of intervention is the degree to which those for whom the intervention is meant to serve find them acceptable.

This statistical analysis has focused on who and where people are food secure or insecure. There are some indicators in the data regarding nutritional practices and food insecurity as well as correlations between poor health and food insecurity. There have been control trial studies, primarily in the USA and Canada, that provide additional intervention and assessed for their effectiveness on diet-related outcomes. These additional elements included nutritional education and client-choice interventions, enhancement of cooking skills, food security status, and fresh produce intake. All studies were small scale, but further measures included diabetes management among recipients and uptake of fresh produce.

What is not clear from the data is what the effects of food insecurity are on people and places. Other research has shown that in addition to negative health outcomes, poor mental health is also an effect of food insecurity (Kinnard and Blake forthcoming). A systematic review of 15

articles by Eicher-Miller (2020) found a strikingly high prevalence of obesity, diabetes, heart disease and related conditions, and depressive symptoms among U.S. food pantry users. Poor physical health can intersect with and reinforce poor mental health. Poor mental health can, in turn, result in a downward spiral whereby mental health decline and increases food insecurity. For example, the inability to be able to afford to eat also means people will have cut back on social engagements and activities, which gives rise to feelings of loneliness and isolation (Blake 2019). As individuals in communities become more isolated, those communities break down. Fear of crime increases as does anti-social behaviour, both of which are indicators of deprivation. Further measures therefore of the success of an intervention will measure the degree to which community members are interacting with each other possibly through increased positive community interactions such as food or knowledge sharing. Connecting people in communities will help reduce and may even reverse some of the local scale vulnerabilities that are amplifying national scale conditions.

Measures identified in this discussion will need to be collected through local scale surveys either directly with service uses before and after programme participation or via surveys that include a control group not participating in the service. At present national statistics are not provided at a fine enough geographical scale or with sufficient detail to be able to measure the changes with certainty.

The research on the interventions and the limited number of studies that evaluate them shows that no single intervention will solve food insecurity nor repair all its effects on individuals, households, and communities. Each type of intervention has a role to play in the current and what will be an exaggerated future context. We need to continue to support those who have reached very low food security and need free food. What is also clear in the evidence from the quantitative part of this study and the research on interventions that much more investment is needed to ensure that people in more localities are able to access food support that targets people who are located within the marginal and low food security categories. For the subset of people who are not confident cooks, cookery lessons, prepared meals and social eating may also be useful interventions. Likewise prepared meals and social eating will be useful for those who struggle physically to cook for themselves as ready meals can be used with a microwave and social eating provided hot meals and an opportunity to socialise.

When brought together in place, as is currently the focus of many local authorities who are developing local food plans, a safety net of interventions that are connected to each other will build ladders of support (Blake 2019b). There are several example case studies in the Healthier and Resilient Food Systems Network web pages (see bibliography for link). This report highlights, however, that while local scale interventions can build resilience to shocks and reduce vulnerability, it is also clear that national scale policy shifts are also needed that increase the financial security of people who are struggling.

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Appendix 1: Food and You 2 data

Food and you 2, wave data are collected approximately every six months starting 26 July 2020. At the time of the commissioning of this research Wave 3 data were the most recent available. Wave 3 was conducted between the end of May to the end of June 2021. On 10 August 2022 Wave 4 data were released. Wave 4 data cover the period Oct 2021-January 2022. Where there are summary data available Wave 2 (November 2020-Jan 2021), Wave 3 and Wave 4 figures are included in this report to show trends. Where specific statistical analysis was undertaken Wave 3 data are used. Sample sizes vary by the surveys and are presented in the table below. A more full description of the methodology can be found on the Food and You 2 website (https://www.food.gov.uk/research/food-and-you-2).

Wave	Sample Size: Adults over 16
1	9319
2	5900
3	6271
4	5796

Source: Food and You 2, Food Standards Agency. 2022.

Appendix B: Food interventions in the UK

Type of Intervention	Nature of operation	Discussion	Reference
Free Food Parcel	Recipients, usually with very low food security receive a three day supply of ambient food to help them weather a short-term emergency. Often associated with a faith based community and run by volunteers. Rarely are users of the service also volunteers. Larger foodbanks often provide information about additional services people can access. Typically operate on a particular day for a limited period of time of 2-3 hours	**Access and eligibility** People are assessed on need and the target participant is one who at time of presentation is experiencing very low food insecurity. Two broad models • Trussell Trust: more than 1,200 food banks across the UK, franchise model independently run but must follow stringent rules including, use of a referral system, limits engagement to three times a year. • Independent Food Banks: 859 in the IFAN network, but there are many more outside this network. Sometimes provide additional wrap around services. Often do not limit engagement with the services and allow self-referral. **Access to food** Primarily store cupboard items. For those in greatest need will provide foods that do not need to be cooked. • Trussell Trust Three day supply from a core list of food items that must be included. Cereal, soup, pasta, rice, tinned tomatoes/pasta sauce, lentils, beans and pulses, tinned meat, tinned veg; tea/coffee, tinned fruit, biscuits, UHT milk, Fruit Juice. • Independent Food Banks offer similar items and many also offer fresh fruit and vegetables or other surplus food items. **Benefits** People access free food to keep from going hungry, enable a brief pause and respite from crisis and the ability to be able to cope with a shock. Sometimes there is access to information about additional support services and benefits that they can access or that they are entitled to. Can be set up easily with limited investment in infrastructure needed to maintain food safety. **Disadvantages**	Blake 20Loopstra et al 2015; Oldroyd et al., 2021; Caspi et al., 2021; Eicher-Miller, 2020; Bryan et al., 2019; Simmet et al., 2017a; Simmet et al., 2017b Byrne and Just, 2022; Remley et al., 2010; Fong et al., 2016, Middleton et al. 2018; Cloke et al. 2017

		• Stigma has been associated with participation. • There are barriers to entry and having to prove need. • The nutritional quality of the food and the ability to make meals has been questioned. • The short timescales associated are not sufficient to help people meet longer term food insecurity needs. • Do not prevent very low food insecurity from recurring or happening in the first instance. • Heavily reliant on donations from the public to maintain the service. • Limited choice of food. • May not be offered when people can access the service.	
Food Clubs and Pantries	Pantries are planned and delivered by local organisations - the RSLs, churches, charities –focus on "priority neighbourhoods". Each pantry is managed by a multi-agency/multi-stakeholder board (which includes also volunteers and members) to oversee and coordinate the operation of the pantries in its area. Pantries comes in different forms: a) **Membership based pantries** which are part of network of "Your Local Pantry", which is a social franchise run by partnership between the	The model is different from a food bank in several important ways, in that is a membership food shop, focused on a particular neighbourhood. Pantries enhance communities and are a preventative approach to food poverty, reducing the risk of household hunger. **Access and eligibility:** • ***Membership based pantries*** - access is controlled through membership subscription and geographical location. Although, there are no time limit on length membership and depends on the individual needs; membership is opened only to members of the community/neighbourhood within a specific postcode (in "priority neighbourhoods" according to the government's indices of multiple deprivation and/or have been referred by a partner agency and meet certain "light touch criteria" of need around whether prospective members are struggling with energy bills or rental payments, or multiple debts or any kind of financial issue that they need help with). Although psychological barrier – stigma is somewhat reduced through the membership fees. However, the membership subscription can act as financial barrier. As studies in in the context of food banks have shown that when 'membership' is means-tested, there is a degree of embarrassment or stigma attached to participation and membership can lead to creation of a two-tier society – while including some, it also	Blake 2020, Maynard and Tweedie, 2021; Lambie-Mumford, 2014; Lasko-Skinner and Jeyabraba, 2021; Saxena and Tornaghi, 2018; Psarikidou et al., 2019; Jenkins et al., 2021;

	Skylight and Church Action on Poverty and Storehouse pantry. The membership-based pantries operate like cooperatives with subscription fee paid weekly (£3 - £5, set the by the pantries) in return for choice of groceries (10 items) worth more several times the subscription fees. **b). Non-membership-based pantries** (e.g., Sharehouse, Foodworks shared market, Neo community). These pantries provide access to food surplus on 'pay-as-you-feel' approach. The users/customers are invited to pay in money, time, or skills. The underlying principle is that of "inclusivity". The fact that they receive food as donations or that they intercept the food makes it possible that the food is not priced.	excludes others who may not it into the membership criteria, but equally experience lack of means to access food. • ***Non-membership-based pantries***: Access is open to all irrespective of economic status, and prices are pay as you feel basis. The choice of maintaining the premises open to everyone is described as 'inclusive'. There is no exclusion based on geographical or socio-economic conditions which also necessitates looking into people's personal conditions or life choices. **Access to food/amount of food**: • In membership-based pantries access to food is controlled in the pantries using color-coded categories depending on the demand and to ensure a fair distribution. During each visit, a member/user can only take a certain number of goods from each of the different categories (1 red; 2 blues; 3 greens and 4 yellows - to ensure a balance of fresh, packaged, and higher value foods). • Non-membership based – operate differently based on the location and set structure. In some pantries like Sharehouse, in one part of the store, food is offered on a pay-as-you-feel basis and users are allowed to take as much as they need, and in another part, volunteers serve the more limited items at a cost of £1 for a basket. However, there is a general restriction in place in terms of two bags of food per person on grounds of fairness. **More than Food: Benefits to members** • **Improves food and nutrition security:** Pantries provide availability, access, and stability of wide variety of healthy and nutritious food to their members. The weekly access to more fruits and vegetable, protein (such as fish, meat, and eggs) means members can choose to eat more healthier food and less process food with more members trying new nutritious food which they could not previously afford. Pantry membership, both the financial savings and the food on offer through the	

		pantry, play important role in helping families experiencing moderate or severe food insecurity **Improves Wellbeing**: improve self-worth and reduce stigma, there is no stigma attached to using the service. Being able to buy good quality food at reduce prices improve self-worth. Provide opportunities for members and non-members alike to volunteer, thereby building confidence and gaining valuable employable skills. Members also build their confidence around food/cooking classes. • **Health outcomes:** Being a member /user of the pantry improves mental health and reduce anxiety – reduces financial worries. Reducing people anxiety of being able to feed themselves help improves their mental health. • **Improves household income:** For a household visiting local pantry once a week could save £780 a year. A typical food basket of pantry is valued at £20 saving members over £15 a visit. Thus, improves members financial wellbeing – savings are used to settle debts and pay other household bills, or buy more quality food from the supermarkets (food they could not afford before) **More than Food: Community benefits/outcomes:** • **Community resilience and social infrastructure:** Pantries play an important role in developing and strengthening local communities. Members feel more connected to their local community through being a member of pantry, enabling members to build social networks -socialising and meeting new friends and felling valued as pantry members. • **Investing in community:** Pantries can also play a part in strengthening the local economy. Several Pantries reinvest their membership fees to purchase additional stock, taking care where possible to support local businesses with their purchases**.** • **Connecting with community services /Strengthening communities**	

		The pantries act as food hub by offering additional support (skills and training – cookery classes/demonstrations) to members, which help members to learn how to cook simple and nutritious meal. Connect members to other social and service providers (debt service recovery groups, local welfare support scheme, pastoral, and spiritual support; benefits and legal advice), therefore able to help members to deal with the root causes of food poverty. **Challenges/limitations face by providers:** • **High dependence on establishing and sustaining relationship** with food industry suppliers to ensure continuous provision of food. Issues of trust, cooperation and reliability are seen as critical when working with multiple stakeholders. • **Logistic and distribution challenges** – investments in infrastructural – transportation, storage facilities (storage space and storage infrastructure (i.e., shelving), and having enough volunteers to deal with coordinating activities. The short of shelf live of the products requires timely sharing of information, especially dealing with diverse supply sources. While sourcing food from national redistributor like Fareshare improves logistical challenges, it can result in 'organisational food losses and waste' due to short shelf life. Direct donations by supermarkets to pantries will reduce losses and waste • **Unreliability of surplus food –** pantries dependent on food surplus except for a small amount of fresh produce which is donated by food growers. The unpredictability of volume and nature of products of food surplus on one hand and control over stock to meet demand is a challenge, especially for pantries sourcing diverse sources. • **Availability and coordination of volunteers –** unavailability of core volunteers particularly during summer holidays and lack of expertise of volunteers provide challenge for organisations • **Financial challenges –** pantries generate income mainly through membership fees to cover cost of personnel, rent and operating cost as	

		well as the services provided; there is high dependence on private and public donations and funds/grants to meet overheads costs - rent and/or infrastructure are considered as the major costs in the running of the pantries.	
The community store/shop	The Community stores/shops are part of the Company shop groups. The community shops are social enterprise that provides its members with vital access to deeply discounted food, as well as life-changing learning and development programmes. Each community shop also houses a Community Kitchen, offering hot meals to members and their families at lower price. As part of the community store, there is community hub that provide host of services to members to tackle the root causes of food insecurity.	**Access and eligibility:** Close access through membership which is based on three criteria: a) people who live locally in a specific local postcode area chosen in line with the government indices of deprivation; b) people living in a household that receives some form of welfare support; c) and those who are motivated to make positive changes in their lives, and want to sign up to their 'Success Plan' which involves individually tailored professional and personal development programmes. The membership runs initially for 6 months and undergoes periodic reviews. **While the membership criteria provide targeted approach to tackle food insecurity and those struggling, it potential excludes other members of the community who may be experience moderate food security but not receiving social support.** **Access to food/amount of food**: Members have access to heavily discounted food and household products up to 70% off the normal retail price, helping to stretch family budgets further. There is no restriction on the amount of food items or households' essentials that members can buy. However, there is restriction on the amount that can be purchased at one time by a member (any 6 of 1 identical item per day). **More than Food: Benefits to members** • **Improves food and nutrition security:** With community shops located in areas lying within the 10-20% most deprived neighbourhoods in the UK – areas with limited access to mainstream shops, limited access to fresh fruit and vegetables, and multiple health issues. The community shops improve the food and nutrition security. With daily access to available healthy foods, 85% members have reported eating heathier –	Blake, 2019; Maynard and Tweedie, 2021; Lambie-Mumford, 2014; Lasko-Skinner and Jeyabraba, 2021; Saxena and Tornaghi, 2018; Moraes et al., 2021

		eating more fruits and vegetables since joining the scheme. The cooking classes and food awareness education aspect of the scheme increases members food knowledge and literacy, and they are better educated to eat healthy at home and to try new food. **The integrated food hub of community shop, community hub and community kitchen provide stability to those members to improve their food security long-term. However, the membership criteria exclude people who may be experience moderate food insecurity but are not benefits.** • **Improves Wellbeing**: paying for the food makes members feel more confidence in themselves which improves their self-worth and feels less stigmatised. The opportunities for members to volunteer at the shop, kitchen and community hub boost members confidence and provide valuable employable skills. For example, in 2021 alone 187 members volunteered or completed work placements with the community hub and 7471 people received support through the community hub programmes. However, non-members cannot volunteer therefore excluding potential people who may not want to sign to the personal development programmes. People report improved self-worth. • **Health outcomes:** Being a member of the community shop improves mental health and reduce anxiety – members do not have to worry about stretching their budget to buy good quality food - reduces financial worries of what they put on the table and allows time to think about their ambitions and their future. Coming to the community shop/kitchen or volunteering improves members physical and social wellbeing. • **Improves household income:** On average, members save of £212 each month on their shopping bill, thereby increases financial wellbeing. Users can buy more wider range of good quality food than would be able to buy if they shopped in supermarkets or local corner shops • **Pathways to employment:** Training schemes help members access employment or self-employment. Many go on into paid jobs elsewhere or gain skills and go into employment within the organisation itself.	

		More than food: community outcomes • **Community resilience and social infrastructure-** The community hub provide advice and activities to members while the community kitchen that service hot meals at lower prices for the members provide good space for members of the community to make new friends and build social networks. Thus improve their social interaction and helped them tackled isolation. The seasonal activities for families and kids help build family bonds and friendship, increase sense of community and belonging. • **Investing in community.** The revenue raised from the in-store sales is invested in the Community Hub, where members can gain access to personal development support, with sessions including everything from cook clubs and home budgeting, to interview skills and business courses and community leadership training. • **Connecting with community services /strengthening communities.** Members who participate in the community hub activities are connected to other support organisations in the communities thereby providing them with opportunity to build back their life. **Challenges/limitations face by providers:** • Start-up costs are high as require suitable infrastructure as requires a kitchen, café, learning space, shop, and outside garden space. Staff are all employed and include specialists to support learning. • Must identify community members to be community connectors and takes time to embed within the community to gain trust and acceptability. • Requires a consistent supply of food so needs to be near an existing company shop.	
Food hubs/ Food clubs	Food hubs or food clubs are set up and provide by organisations that work in	**Access and eligibility:** Open access, although, is membership base, there is no membership criteria, anybody can register to join the scheme/hub near them for free. However, TBBT may charge a membership fee in respect of	TBBT, 2021

	partnership with other community groups to provide food provision service to members. An example is The Bread-and-Butter Thing (TBBT). TBBT aims to make life more affordable to people. It works closely with suppliers to encourage and help them to donate their surplus food safely and effectively, which they then redistribute to their network of members, via their food hubs and partners. They work in collaboration with local partners and national networks to create bespoke packages of support for local communities - offering advice and practical solutions for dealing with debt, managing utilities, and accessing mental health support and available grants and funding.	certain benefits provided to our members. There is weekly membership fee of £7.50 for roughly £35 worth of food each week including fresh fruit and veg, chilled food for the fridge and cupboard staples such as pasta and cereal. **Access to food/amount of food:** There are different levels of membership available as part of the Food Scheme as follows: (a) Individual Food Members where the weekly membership fee will entitle you to collect one bag of items comprising a combination of ambient food, chilled food, frozen food and fruit and vegetables. (b) Family Food Members where the weekly membership fee will entitle you to collect one bag of fruit and vegetables, one bag of a combination of ambient food and household goods and one bag of a combination of frozen and chilled food (the Family package). (c) Large Family Food Members where the weekly membership fee will entitle you to collect the Family package PLUS an extra bag of a combination of frozen, chilled, and ambient foods and household goods (depending on the volume of goods supplied to us on the day). (d) Extra Large Food Members where the weekly membership fee will entitle you to collect two times the Family package. The different levels of membership means that members join the scheme at the levels that provide them will the right amount of food that they need meet their food needs if not all of it. **More than Food: Benefits to members** • **Improves food and nutrition security:** Evaluation report of TBBT as example of food hub shows that members have access to vast variety of good quality food (including fruits and vegetables), which improves diets by increasing the range and quality of food available to people on a tight budget. Enable them to try new foods and cook more healthily at home. Although, weekly food packages may vary	

		depending on the stock available of surplus food received through Xcess, the independent food redistribution network and to ensure variety. Food hubs to address food insecurity and reduce foodbank use. Evaluation report by TBBT shows that over 50% of members have never used a foodbank, thus able to address the needs of people facing moderate food insecurity before they get to the point where they turn to food banks. While 16% of members have stopped using food bank entirely since joining TBBT and further (6%) have managed to reduce their foodbank. • **Improves Wellbeing -** Using the food hubs reduces stress, enables people to feed their families and have money left over from their food budget. Since the scheme is opened to everyone and amount of food received depends on individual family needs, it reduces stigmatisation and improves self-worth. Food hubs provide volunteering opportunities for both members and non-members increasing confidence and gaining employable skills as well as address the issues of social isolation and loneliness in the community. • **Health outcomes**: Membership of the scheme improves mental health/ reduce chronic diseases as members have access to more healthy and nutritious diets. Also reduces anxiety and members do not have worry over decisions between paying bills and buying food. **Food hubs which accept NHS Healthy Start Vouchers** enable Healthy Starts vouchers holders to stretch their £4.25 to buy £35 worth of food including a great mix of fresh fruit and veg for just £3.25. • **Improves household income -** On average, hub member will save £26.50 each week on their food budget, leaving them with surplus income to purchase more than the basics things for their families and savings are channelled into utility bills and paying off debts. **More than food: community outcomes:** • **Community resilience and social infrastructure-** Being part of food hubs connects people to their community, where they are	

		meeting new people and making new friends and get people more involve in their community. Working with community partners to establish the hubs create community resilience and social infrastructure for members and the community. • **Connecting with community services /strengthening communities.** Members buying the food packages in their community spaces often provides an informal opportunity for them to engage with other support services that they wouldn't necessarily have done before, in turn supporting them to rebuild their resilience **Limitations and challenges face by providers** • See section on food pantries	
Voucher schemes	Voucher schemes provide food vouchers to specific groups of people to enable them access healthy food. There are both governments run schemes like the Healthy Start Vouchers – England (pregnant women and families with children under 4 years) and best start food scheme in Scotland; and Charity funded food voucher scheme like the Alexander Rose Voucher Scheme and Research funded project like Fresh Street Voucher Scheme. The Rose Vouchers for Fruit & Veg Project helps families on low incomes to	**Eligibility and Access**: • **The Rose VS is close access scheme** in that it is open to families in low income within the local community and to eligible for Rose Vouchers families should meet the criteria for the Healthy Start voucher scheme for pregnant women and families in receipt of benefits. Households receives £3 a week for each child; or £6 if the child under 1yrs old. The distribution of the vouchers takes a community-based approach and are based children centres who recruit participants. The vouchers are redeemable only in at local market fresh fruits and vegetables traders. Linking eligibility criteria to the HS means that man low-income households on income tax credits and low paid jobs. However, a family's financial situation is constantly changing, and some participants described drifting in and out of eligibility for the Rose Vouchers. • **The Fresh Street scheme is open scheme** - an area or place-based scheme geographically defined streets or areas of high economic deprivation and low Fruits and Vegetable consumption. Every household, regardless of income or household composition (not individuals) living the geographical area receives £5 a week. households are encouraged to share vouchers and vouchers are	Relton et al., 2020; Relton et al., 2019a; 2019b; Parnham et al., 2020; McFadden et al., 2014; Alexander Rose Charity, 2021; Susan, 2014; Messer, 2017

	buy fresh fruit and vegetables and supports them to give their children the healthiest possible start and to promote healthy eating. The Rose vouchers provide additional Rose vouchers to young families buy matching their Healthy Start entitlement. The Rose VS build on local partnership to make use of existing local resources and facilities. (d) providing support such as cooking classes to build their skills and confidence. The Fresh Street Vouchers provide Food voucher for only FV with healthy diet recipes and information pack. The approach takes a neighbourhood target a whole street or neighbourhood irrespective of one economic status	redeemable in only local fresh FV shops/ market stalls (not supermarket) or locally produced FV supplied bag by Regather cooperative. While placed based vouchers have greatest impact because of local stakeholders and community buy-in, it may exclude potential benefactors who may be living outside the defined geographical area. **Access to food/amount of food** • The voucher scheme provide access to only fruits and vegetables to the recipients and in low-income families and areas where access to fruits and vegetables is limited. **More than Food: Benefits to recipients:** • **Improves food and nutrition security:** The Voucher scheme improve food related behaviours linked to increased vegetable and fruit intake in both children and adults and improve access to wide range of retail outlets selling fresh fruits and vegetables that also provide cultural varieties. The Voucher scheme increased the amount of money spent on fruit and vegetables as a percentage of the family budget and result in significant changes in behaviour around food and meals -improve healthy diet and changes eating habits - particularly snacking due to availability of fruits in the house. • **Behaviour changes and healthy eating outcomes**. It changes the way the participating parents and recipients buy, shop, and cook. The Voucher scheme increased vegetable and fruit intake in both children and adults - although variation exist in the increase of fruits and vegetables intake among children and adults. In some case studies adults' vegetables intakes decrease with children consuming more vegetables and vice versa. Having the voucher makes one think about what they are eating and therefore try to eat healthily. Vouchers change shopping habits with some participants shopping more in the local markets - they found it is cheaper than in supermarket and therefore stretch budget and provide more variety. Providing vouchers with recipes and healthy diet information has the potential	

		to spark changes in householders' food preparation patterns with some householders increasing the numbers time they cooked from scratch • **Improves Wellbeing** – Particularly, with the Fresh Street scheme because many people within a defined geographical area are participate such voucher scheme removes stigmatisation which are often associated with voucher scheme use/redeemable at the supermarkets • **Improves household financial wellbeing -** The vouchers increase recipients food spending budget. Particularly, the Rose Voucher adds value to the existing Healthy Start scheme means families could double their fruits/veg spending **More than Food: Community outcomes** • **Community resilience and social infrastructure** Buying from community markets and stalls increase social cohesion in neighbourhood and provides meeting place for diverse community members for connections and conversations. Place-based voucher scheme has the potential to increase social interaction - as children playing together in street can deliver delivered vouchers and participating households can swap vouchers leading to community cohesion. • **Investments in local economy** - Vouchers are mostly redeemed at the local fruits and vegetable markets/stalls - increasing customers for participating stalls, co-operatives and FV producers and increase spending in local market and have the potential to increase footfall in local markets. Increase spending on FV - importantly, such area-based vouchers have the potential for long term impact on fresh FV consumption as many householders intend to continue consuming the same amount of FFV as they did with the vouchers. • **Connecting with community services /strengthening communities** Place-based voucher scheme is likely to received greater level of support from local stakeholders and leaders and therefore have	

		maximum impact. And the Rose VS are delivered in partnership with existing local organisations and existing activities focused on health and wellbeing to support families in their local area therefore increase community resilience and social interactions.	
Cooking schemes	Cooking lessons with food that is affordable but healthy offered in a local setting such as a school or community centre. Generally charge a small fee to cover food costs and other expenses. Often offered over a number of weeks.	**Eligibility and Access** Local community organisations and independent cooks offer cookery courses across the country on a hyperlocal basis to community members. We do not know much about these or where they are. The bulk of the information that is available concerns a larger intervention called Bags of Taste. There are sites in Hastings Maldon Sheffield, Thanet and several locations around London including Islington, hackney, Haringey, Sutton, Newham, Tower Hamlets, Waltham Forrest and Wandsworth. It is not clear how often people are able to access these courses. Residents are offered a free delivered ingredients bag and course materials containing food for seven meals and three recipes and then participate in a two-week course. Meals are priced at £1 per portion. Shopping guides and recipes are tailored to local populations to ensure access to ingredients and that menus are acceptable for people living in those areas. Bags of Taste report the following benefits: • Increased cooking, nutrition and budgeting skills. • Opportunities to try new foods and eat or take home a hot meal. • Opportunities for social connections and • Some indication that participants are eating better and have healthier diets. • Some indication that participants are saving money. **Benefits identified from studies in the US** Caspi, C.E., Davey, C., Friebur, R. and Nanney, M.S., 2017. Results of a pilot intervention in food shelves to improve healthy eating and cooking	Caspi et al, 2017; Clarke et al 2011; Biel et al 2009.

		skills among adults experiencing food insecurity. *Journal of hunger & environmental nutrition*, *12*(1), pp.77-88. • intervention - 6-week of cooking and nutrition education class - involving 45 participants • outcome - Improvement in diets and cooking skills. Participants demonstrated improved cooking skills scores post-intervention (P= 0·002). This study provides some evidence that improvements in diet and skills can be demonstrated with minimal intervention Clarke, P., Evans, S.H. and Hovy, E.H., 2011. Indigenous message tailoring increases consumption of fresh vegetables by clients of community pantries. *Health communication*, *26*(6), pp.571-582 • RCT involving 706 participants - Nutrition education and recipe provision and food tips • Outcome : Improvement in the consumption of fresh vegetables, food-use booklet retention and useVegetables. Results demonstrated benefits of tailoring over both generic and control conditions and uncovered the degree of tailoring that produced the largest effects (P< 0·001). The intervention addressed recipients' immediate and concrete decisions about healthy eating, instead of distant or abstract goals like prevention of illnesses. The study documented per-client costs of tailored information. Results also suggested that benefits from social capital at sites offering a health outreach may exceed the impact of message tailoring on outcomes of interest. Biel, M., Evans, S.H. and Clarke, P., 2009. Forging links between nutrition and healthcare using community-based partnerships. *Family and Community Health*, *32*(3), pp.196-205	

		• Intervention pre-post trial of 1087 participants. Nutrition education and cooking demonstration Display the message about the associations between diet and health, cooking demonstration, provision of fresh food • Outcome - Improvement in the number of clinic visits. Pantries and nearby clinics can be brought into collaboration to meet common goals in preventing diet-related illnesses and helping people with such conditions effectively access needed health care. Clinics can effectively partner with food pantries, an overlooked resource for health promotion **Some limitations identified more widely (not specific to this scheme)** include: Are rejected if patronising. Groups must be small. Require cooking infrastructure for participants and demonstrator. No follow up studies to determine how long benefits last.	
Social Eating	Eating together in a community setting. Often run by volunteers, participants pay a very low cost or donation. Offered on a weekly basis. Meals are served on shared tables. Cooked health food. Often framed in terms of an opportunity to socialise. Do not target specific groups. Do not limit participation. Place-based to attract a local	Social eating activities include eating a cooked meal together in a particular location. These range from soup kitchens that target usually the homeless to activities that specifically work to attract a wider group of people. **Access to meals** • Typically not available everyday and are run by volunteers. Provide access to low-cost cooked meals that are healthy. • Can be accessed without needing to use domestic utilities and does not require that the participant have cooking skills and domestic cooking tools and appliances. • Provide opportunities for social interactions. • Few barriers to participation. Limitations	Smith and Harvey, 2021, Marovelli, B., 2019; Björnwall, et al., 2021; Luca et al., 2022

	population but not limited in this way.	• Little choice in meals. • Requires a kitchen and dining space that conforms to safety standards. • Staff must be trained food handlers with appropriate food safety training • Sometimes social norms of dominant groups are not comfortable for those not part of that group. Can lead to feelings of discomfort and exclusion.	

Appendix C: Interventions for addressing economic-based food insecurity

Intervention	Foodbank TT	Independent Foodbank	Food club/pantry	Cook at home ready meals	Social Eating	Cooking Lessons	Vouchers	Low-cost loans
Target/Location	deficit--most needy; churches, community centres, schools	deficit--most needy; churches, community centres, schools	place-based high IMD; housing associations, mobile units, community centres	Unclear how recipients are targeted; Café networks, mobile delivery	place-based, determined by participants,	place-based	Alex Rose--benefits and children; Fresh Street place-based, fruit and veg shops and market stalls.	Iceland shoppers; Iceland stores
Barriers to participation	referral, 3x3day food, very low food security, may only be a couple of hours a week, no provision in some areas.	self-referral, demonstrate need, very low food security, may only be open a couple of hours a week, there are rural delivery services in some places, no provision in some areas.	must live in area, limited by hub capacity and food stocks, no delivery though neighbours sometimes collect for each other, no provision in some areas	cost and availability	limited availability, can be dominated by core group which can be a barrier for some.	small number of participants per session. Limited availability.	must live in area where available; Rose vouchers must demonstrate need.	application
Food Ladder Rung	**catching**	**catching**	**capacity building**	**catching**	**transformation**	**capacity building**	**capacity building/ transformation**	**capacity building**

Economic impacts

Intervention	**Foodbank TT**	**Independent Foodbank**	**Food club/pantry**	**Cook at home ready meals**	**Social Eating**	**Cooking Lessons**	**Vouchers**	**Low-cost loans**
Cost	Free to users	Free to users	Pay as you feel; Between £3-£8; Depends on scheme	£1-£2,	PAYF,Give what you can, low cost	Free or £2-£3	Free to users	Ordinary cost of food (Iceland)
Access to support services	Sometimes	yes	Often	no	no	no	no	no
Stretch budgets	marginal	marginal	yes	yes	yes	yes	yes	yes
helps distribute uneven pinch points in the budget	no	no	yes	unknown	unknown	no	yes	yes
Allows people to avoid debt to high-cost lenders	unknown	unknown	yes	unknown	unknown	yes	unknown	yes
Improves credit	no	no	no	no	no	no	no	yes
Employment skills	no	no	yes	no	possibly for organisers	no	no	no
Money stays in place	N/A	N/A	yes	yes	yes	unknown	yes	no
Employment opportunities	no	no	Community Shop	unknown	no	no	no	no
Maintains existing markets	no	no	no	no	no	no	Fresh Street	yes
Creates local markets	no	no	no	no	no	no	Fresh Street	no

Food Impacts Intervention	Foodbank TT	Independent Foodbank	Food club/pantry	Cook at home ready meals	Social Eating	Cooking Lessons	Vouchers	Low-cost loans
Increased amount of food hh have	yes	yes	yes	yes	yes	Bags of Taste	yes	yes
Improves food access where the service operates	yes	yes	yes	yes	yes	unknown	yes	yes
improves local food availability	marginal	marginal	yes	meals only	meals only	no	Fresh Street	unknown
Better food	no	sometimes	yes	yes	yes	yes	yes	yes
Improves diet	no	no	yes	yes	yes	yes	yes	yes
Increased fruit and veg consumption	no	sometimes	yes	yes	yes	yes	yes	unknown
Special Dietary needs met	no	no	sometimes	sometimes	sometimes	sometimes	yes	yes
Enables bulk cooking at home	no	no	yes	no	no	yes	no	yes
Healthy cooking at home	no	sometimes	yes	no	no	yes	yes	yes
Offers Choice	no	sometimes	sometimes/ limited	limited	no	limited	Fruit and veg only	yes
Exposes to new food types/Diet diversity	no	sometimes	yes	sometimes	sometimes	yes	yes	unknown
Improved food skills	no	no	yes	no	no	yes	yes	unknown
Increased enjoyment of food	no	no	yes	unknown	unknown	yes	yes	unknown
Reduce foodbank use	N/A	N/A	yes	unknown	unknown	yes	unknown	yes
Food Security	emergency need	emergency need	preventative	preventative	preventative	preventative	unknown	preventative

Social impacts

Intervention	Foodbank TT	Independent Foodbank	Food club/pantry	Cook at home ready meals	Social Eating	Cooking Lessons	Vouchers	Low-cost loans
Increased social ties	no	sometimes	yes	no	yes	yes	some sharing with FreshStreet	no
Volunteering opportunities for participants	no	no	yes	no	yes	no	no	no
Know community more	no	no	yes	no	yes	yes	Fresh Street	no
Opportunities to socialise	marginal	marginal	in queue	no	yes	yes	no	no
Acceptable	low uptake; reports of stigma, shame and avoidance. Last resort	low uptake; reports of stigma, shame and avoidance. Last resort	unknown among wider population, seen as a more acceptable tool compared to foodbank; enjoyment among users	unknown	unknown among wider population, enjoyment by users	unknown	yes, high uptake and use by those offered the vouchers. More acceptable than healthy start	among users/ though wider concern over borrowing to eat
Individual impacts								
Self-confidence	no	no	yes	no	yes	yes	unknown	yes
Reduced isolation	no	no	yes	no	yes	yes	Fresh Street	no
Reduced stress	mixed	mixed	yes	unknown	unknown	yes	unknown	yes
Wellbeing improved	no	no	yes	unknown	yes	yes	unknown	yes

Enables participants to express values

Intervention	Foodbank TT	Independent Foodbank	Food club/pantry	Cook at home ready meals	Social Eating	Cooking Lessons	Vouchers	Low-cost loans
Thrift	no	no	yes	yes	yes	yes	yes	yes
Environmental (food waste reduction)	no	no	yes	depends on provider	yes	depends on provider	no	no
Stewardship of household resources	no	no	yes	unknown	unknown	yes	yes	yes
reciprocity	no	no	yes	no	yes	yes	yes	yes
good health	no	no	yes	yes	yes	yes	yes	yes
care for family	yes	yes	yes	unknown	unknown	yes	yes	yes
care for self	no	no	yes	yes	yes	yes	yes	yes
participation in economic life	no	no	yes	yes	yes	yes	yes	yes