Supporting communities in social housing and optimising urban food system interventions for equity (SCHOUSE): a clustered randomised controlled trial

Protocol title

A study testing local fresh food initiatives within social housing communities

Funding

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Protocol summary

Rationale

Poor physical access to retailers that sell fresh fruit and vegetables at affordable prices can be a significant barrier to consuming a healthy diet, and low intake may increase the risk of poor diet and diet-related illness [1–5]. In the UK, social housing communities are particularly vulnerable to such barriers and risks[6–8]. Yet evidence overlooks how interventions to improve access to and affordability of fruit and vegetables affect diet quality in these communities. Our three-arm, clustered, randomised, controlled trial addresses this gap by delivering and evaluating two place-based, co-designed interventions in social housing communities in Liverpool, UK.

Objectives

To compare differences in fruit and vegetable intake between:

A. A comparison group who receive signposting to support and community food initiatives (Comparator), and a group who additionally receive a new weekly mobile greengrocer stop in their neighbourhood (Intervention 1), and

B. Intervention 1 and a group who receive provision of weekly vouchers for use at the greengrocer in addition to a new weekly mobile greengrocer stop in their neighbourhood (Intervention 2).

Methods

Using geographical modelling techniques, we will prioritise 12 target sites (0.5 km radius) characterised by poor geographic access to healthy food and a high density of social housing stock from three housing association partners. We will randomise these sites into three parallel arms: (1) Comparator (enhanced signposting to support and community food initiatives); (2) Weekly site visit by mobile greengrocer for 26 weeks + (1); (3) Vouchers to purchase fresh fruit and vegetables from mobile greengrocer for 26 weeks + (2). We will recruit the primary adult food procurer from 30 households in each site (n = 360 households). To be eligible, participants must reside in a socially rented property managed by one of our housing association partners. We will measure our primary outcome – fruit and vegetable intake – remotely via web-based 24-hour multiple-pass dietary recalls at baseline, midpoint and endpoint. At each timepoint, participants will also complete an online questionnaire measuring behavioural, psychological, social, and health-related variables. Recruitment and trial launch will be staggered, with each wave comprising three randomly selected sites, which will in turn be randomly assigned to one of the three trial conditions. Each wave will begin approximately one month after the prior wave. The data collection period will start in September 2026 and conclude in August 2027.

Anticipated implications

To our knowledge, this trial is the first to specifically target social housing communities with interventions to improve physical and economic access to fruit and vegetables. It will generate important insights into the effectiveness of a place-based intervention in addressing physical access as a barrier to fruit and vegetable intake. Additionally, it will allow us to compare the intervention's effectiveness on fruit and vegetable intake when potential financial barriers are addressed simultaneously.

Overview

Rationale & background information

People who live in social housing, which includes subsidised housing provided by Private Registered Providers (i.e. housing associations) and local authorities, can face difficulties accessing a healthy diet and may struggle to afford food, often needing to use food banks[8,9]. While this may partly be because they face material disadvantages, such as lower incomes or a lack of good-quality employment opportunities, it may also be because the neighbourhoods where they live offer fewer opportunities to buy affordable, healthy food. Poor diet and ill-health are strongly linked, and people in social housing are more likely to have diet-related health conditions [10,11]. The SCHOUSE project[12] seeks to better understand why these issues exist and how to improve the life chances of people living in social housing. This 36-month interdisciplinary collaborative project has been funded by UK Research and Innovation (UKRI), and its research activities predominantly focus on Liverpool, which has some of the most deprived areas and the highest rates of obesity in the UK.

The SCHOUSE project comprises three work packages (WP). The present protocol focuses on the activities of WP2. In WP2, we will co-design, trial and evaluate two existing interventions in Liverpool with a new target population: individuals and families residing in social housing. These interventions aim to help residents access fresh fruit and vegetables through (i) Use of a mobile greengrocer (known as "Queen of Greens"), which provides local access to fresh fruit and vegetables, and (ii) Provision of Rose vouchers (from the Alexandra Rose Charity) for purchasing fruit and vegetables from the Queen of Greens. To do this, we are working in partnership with several delivery partners: the three major social housing associations in Liverpool (Onward, Riverside and Torus); the local social enterprise Alchemic Kitchen (which runs Queen of Greens); and the Alexandra Rose Charity. We have worked closely and iteratively with these delivery partners, other partners (including Liverpool City Council and the Health Equalities Group), and local residents to develop the current protocol.

Project goals and objectives

The goal of WP2 is to produce high-quality evidence detailing the impacts of the two interventions (described above) on communities living in social housing with poor access to healthy and affordable food. The primary objective is to evaluate the extent to which each intervention increases trial participants' fruit and vegetable intake and the differences between them. As secondary objectives, we will explore whether the interventions influence trial participants' mental well-being and social connectedness. We will also investigate the impacts the interventions may have on trial participants' experiences of food insecurity and their use of food aid and support. Lastly, we will consider the role the interventions may have in influencing trial participants' broader dietary patterns and behaviours, food preferences, and barriers to consuming fruit and vegetables.

In WP2, we will collect additional data required for WP3. WP3 will take the results from the interventions in WP2 (fruit and vegetable intake and other dietary measures) and combine them with other available datasets and evidence, including their relationships with health outcomes, to co-create modelling scenarios with stakeholders. These models will assess the long-term population health impacts of the WP2 interventions, using the latest version of a discrete-time stochastic dynamic microsimulation model ($IMPACT_{NCD}$), which has been used internationally to model health trends and impacts of public health interventions.

Lastly, we will collect data in WP2 to provide quantitative support for the preliminary findings from qualitative research activities in WP1 and WP2, as well as from stakeholder and community co-design workshops that

informed the design of the trial. As part of WP1, we have conducted 30 interviews with adults living in social housing from areas of high and low risk for dietary inequalities (as characterised by mapping and modelling work conducted in WP1). These interviews explored factors affecting access to food and their impact on dietary decision-making and health, to develop an understanding of food access, affordability, and social/cultural norms within households residing in social housing and in social housing neighbourhoods across different areas of diet-related risk. In the WP2 trial, we will ask participants about key factors identified in early WP1 research findings and WP2 co-design workshop outputs to assess the prevalence of these factors thought to impact food access.

Trial design

The SCHOUSE trial is a community-based, longitudinal, superiority, cluster randomised controlled trial in Liverpool, UK. Using geographical modelling and public and stakeholder engagement, we have identified 12 priority sites for intervention. These sites (clusters) will be randomised 1:1:1 into one of three arms (Comparator, Intervention 1 or Intervention 2). The trial will run for six months at each site. For the duration of the study, all participants in each site will receive the intervention to which their site was randomised. We will recruit 30 participants in each of the 12 sites (n_{total} = 360).

At baseline, midpoint and endpoint, participants will complete a questionnaire and three 24-hour dietary recall reports. We are collecting data at both the midpoint and endpoint, as we think intervention effectiveness may differ between time points. We think the minimum amount of time required for the interventions to become normalised within the community, familiar, and part of people's routines may be around the three-month mark (week 11 of the trial; midpoint); thus, we expect this to be the earliest we might see a noticeable effect on our primary outcome (daily fruit and vegetable intake). Around five months into the trial (week 22; endpoint), we believe the interventions will be well established, but effects on daily fruit and vegetable intake may begin to diminish as the novelty wears off. We chose differences in daily fruit and vegetable intake at the endpoint between interventions as our primary outcome. We chose the endpoint over the midpoint because, as it is a longer time period, differences may better reflect sustained dietary change, which is more relevant to health.

Target population and sample

The target population for this study are social housing residents living in target sites in housing rented from three partner housing associations. The person recruited to participate will be the primary adult responsible for food acquisition in their household. They will answer questions for themselves and, where applicable, about others in their household.

To be eligible to take part, a participant must live in one of the 12 sites and be a social housing resident in a property managed by one of our three partner housing associations (Onward, Riverside, or Torus). The participant must be the primary food procurer for their household, 18 years or older, and not be in receipt of Rose vouchers.

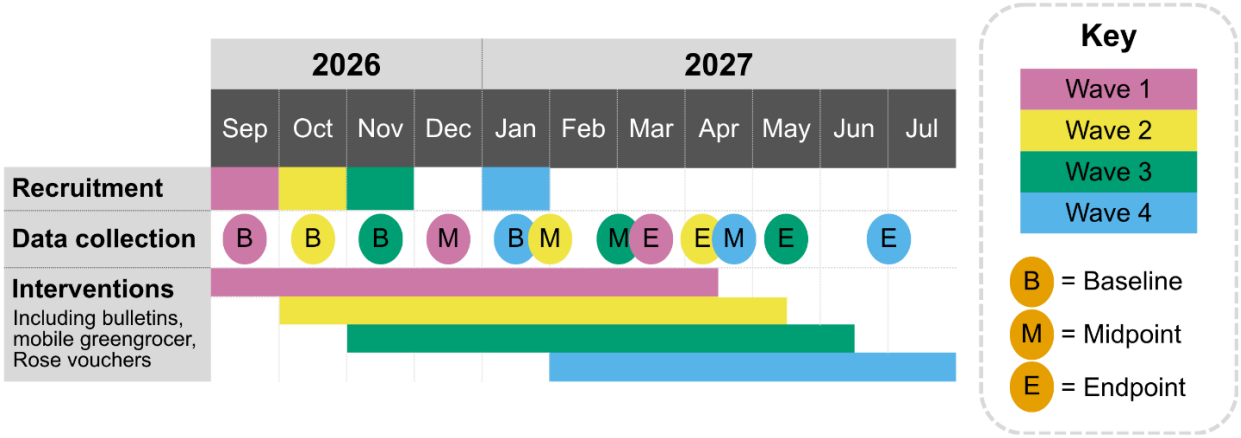
Methodology

Timeline

Recruitment and data collection will be staggered in four waves. Each wave will comprise three sites randomised to the trial conditions: Comparator, Intervention 1 and Intervention 2. Participant recruitment at a site will begin one month before the comparator and intervention conditions are scheduled to start there (see **Figure 1**). We consider the trial to have started at a site once the intervention begins, not at the start of the recruitment run-in period.

Recruitment for Trial Wave 1 will begin in the week commencing Monday 7th September 2026, and the interventions will begin in those three sites on Monday 5th October 2026. The trial will run at each site for 26 weeks (approximately six months). The final wave, Trial Wave 4, will end in late July 2027.

Figure 1 Timeline for recruitment, data collection, and interventions for each Trial Wave



Site selection

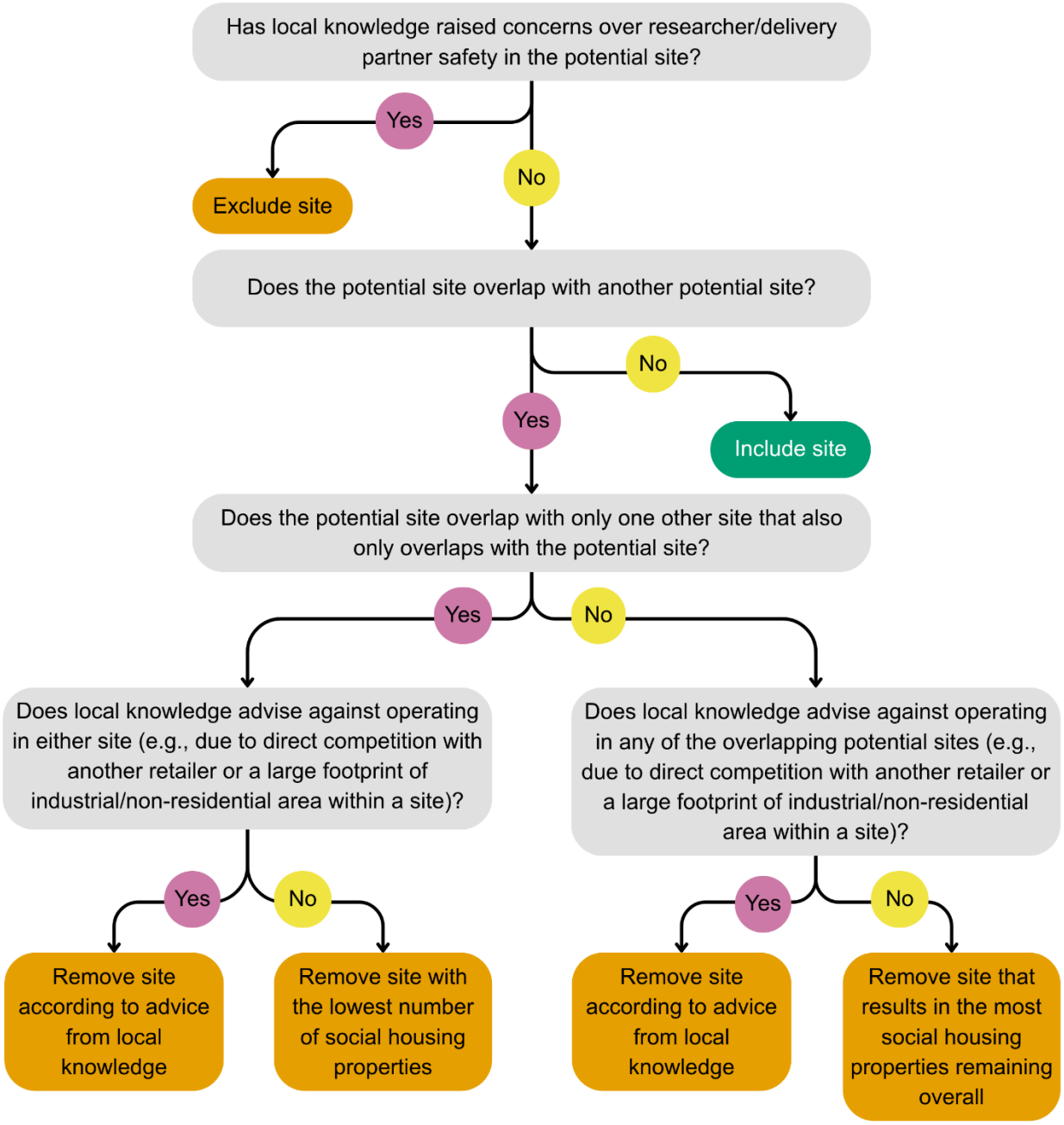
To identify and prioritise potential intervention sites based on need, we used a Location-Allocation approach. We iteratively co-designed the approach with stakeholders and community members during a series of co-design workshops in Autumn 2025. In brief, we used a Maximum Coverage Location Problem (MCLP) algorithm to optimise potential locations based on those with the highest 'need' and existing provision. Candidate sites were defined as any postcode within the Liverpool local authority area that had at least 100 households managed by our partner housing associations within a 0.5km radius of the postcode. The model then optimised these postcodes based on an index of 'need', a 0.5km catchment radius, and a location at least 1km from an existing Queen of Greens stop. The output was a map showing 20 selected postcodes that the model suggested were optimal locations for intervention. We then added a 0.5km radius buffer around them to identify potential intervention sites within it (e.g., to identify the best places for parking).

To quantify 'need', we created an index for all postcodes in Liverpool. The co-design phase identified a preference for a parsimonious need index that included only key conceptual factors related to the issues Queen of Greens and SCHOUSE were tackling (e.g., social housing, food environment, accessibility, deprivation). Indicators were generated from a mixture of area-level data and postcode-generated estimates. Indicators included: (i) percentage of households residing in social housing (Output Areas from Census 2021[13]), (ii) Index of Multiple Deprivation (IMD) (Lower Super Output Areas[14]), (iii) distance to the nearest public transport stop[15], (iii) distance to the nearest fast food outlet[16], and (iv) distance to stores which commonly sell fresh fruit and vegetables (e.g., supermarket, food market, greengrocer)[16]. For distance metrics, we calculated street network routing using OS Open Roads[17]. We then used Principal Components Analysis to create a summary index of all indicators combined (scaled using z-scores in the same conceptual directions for need). We selected the first two components, which explained 69% of the variance. The first component represented accessibility, while the second captured socioeconomic context. Further components explained smaller amounts of variation (<10%) and added little qualitative sense or value to the model. We calculated a weighted average of the overall index score, assigning weights based on the variance explained by each component.

We then hosted a series of meetings with our housing association partners, Queen of Greens, and Neighbourhood Managers from Liverpool City Council to assess the feasibility of running the interventions

in each of the 20 identified areas. Using this local knowledge, we shortlisted 12 areas (**see Figure 2**) and then confirmed their feasibility with Queen of Greens.

Figure 2 Framework used to identify 12 target sites for the trial from the 20 potential sites identified from the MCLP model



Recruitment

We will work with our three partner housing associations and community organisations to advertise the study to potential participants living in the 12 study sites.

Our primary recruitment strategy is to drop flyers at eligible properties in each site. Initially, in each site, our housing association partners will distribute 300 flyers to eligible households (100 flyers per housing association partner). If a housing association partner has fewer than 100 properties in a site, the remaining flyers will be distributed equally between the other housing association partners. If two housing association partners have fewer than 100 properties in a site, the remaining housing association partner will receive all excess flyers to distribute to their properties. In sites where a housing association has fewer than 20 properties, the partner will initially forgo involvement to manage and focus staff workload. However, if recruitment is challenging in such sites, these properties will receive flyers.

If the flyer strategy is insufficient to meet our recruitment targets, we have several other approaches to fall back on. In collaboration with the housing association partners, researchers will follow up the flyer drops with door knocks a couple of days later to stimulate interest and sign-ups. Further, housing association partners will directly recommend participation in the trial to residents they are in contact with. They will also distribute flyers at housing surgeries and place posters in key community locations. We are also working closely with community leaders, partners, and organisations, as well as Neighbourhood Managers (from Liverpool City Council), to determine how best to distribute information about the trial participation opportunity in each site. If required, we may also advertise the trial participation opportunity on various social media channels or newsletters and encourage recruited study participants to share information about the trial with their neighbours. Where deemed appropriate, researchers will also distribute flyers at local community events.

Procedure

Figure 3 presents a flow diagram of the trial**.**

Screening, participant information, and consent

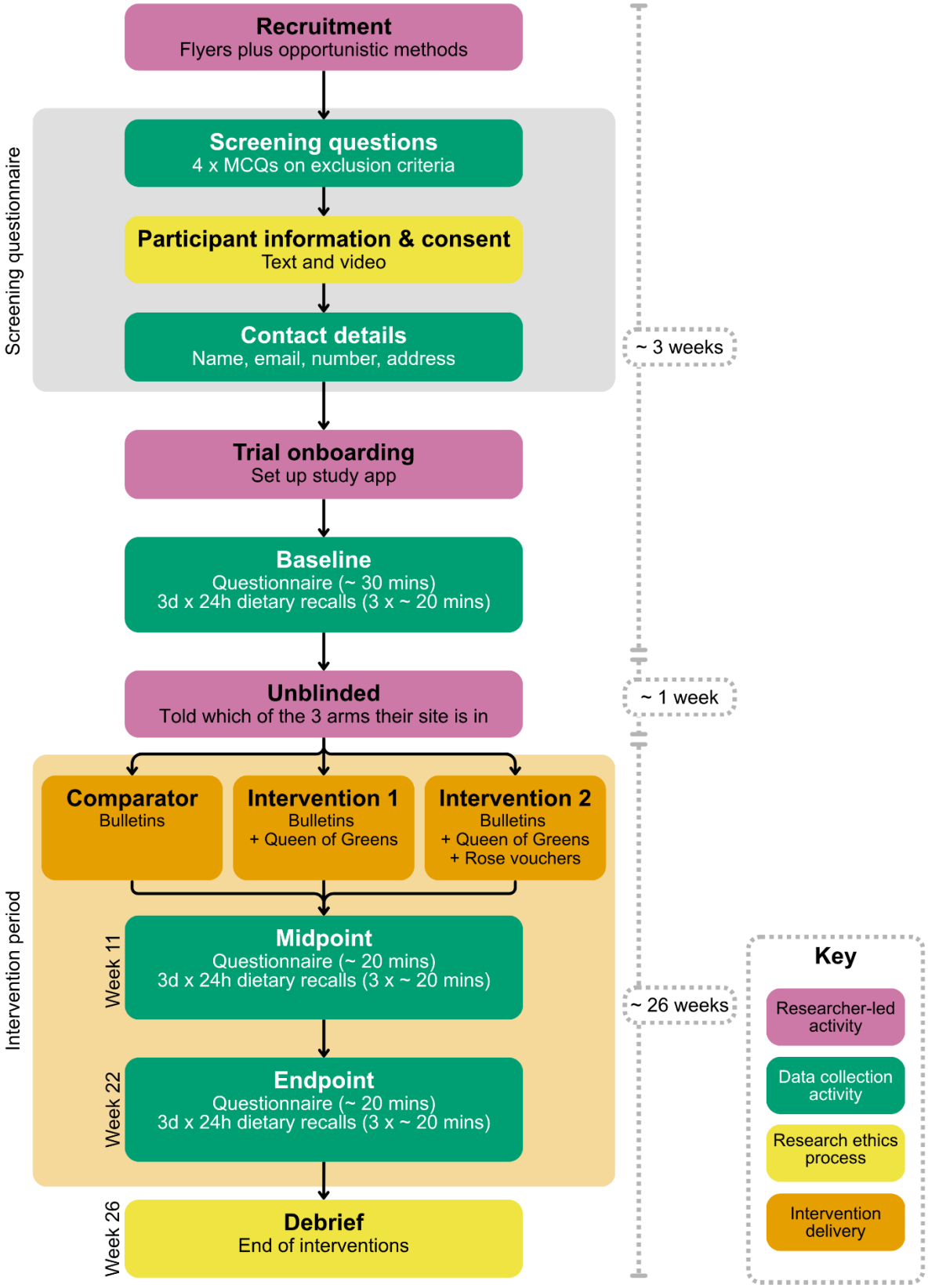
Recruitment materials will include a link and QR code that takes potential participants to a screening questionnaire hosted on Qualtrics[18]. We will also provide contact details (phone number and email address) for the research team so that individuals can contact us with any queries or if they are unable to complete the screening questionnaire online.

On the screening questionnaire landing page, potential participants will first see some brief information about the trial and its eligibility criteria before answering four short screening questions, asking about their (i) age, (ii) social housing provider, (iii) whether they are currently in receipt of Rose vouchers, and (iv) who is responsible for getting food for their household.

The screening questionnaire will end if a respondent's answers indicate they are not eligible to take part in the trial, in which case we will present the following message:

> "Thank you for your interest in taking part in this study. Unfortunately, your answers suggest that you might not be eligible to take part at this time. This may be because:
>
> - You are under 18 years old,
> - Your housing provider is not Onward, Riverside, or Torus,
> - You are currently receiving Rose vouchers, or
> - Someone else is responsible for getting the food for your household.
>
> If this seems incorrect or you have any questions, please contact the researchers (Courtney and Nat) by email (schouse@liverpool.ac.uk) or phone, SMS, or WhatsApp (+447345 442688), and they will be happy to help you."

Figure 3 Flowchart of participants' journeys through one trial wave and corresponding timelines



If a respondent's answers indicate they are eligible to take part in the trial, we will ask them to read the participant information on the following pages. The information will also be available in a video format, in case some potential participants find the participant information inaccessible. We will also offer participants the option to contact us to receive the information in a different language, so we can use an interpreter service to support them in joining the trial, if they would like to.

After respondents have read the participant information, we will present an online consent form for them to complete if they wish to join the trial. We will then ask anyone who completes the consent form to provide their name, phone number, email address, home address, and preferred contact method. Then, we will use these details to contact respondents, onboard them to the trial, and confirm which trial site they reside in. The final page of the questionnaire will inform respondents to expect to hear from the research team in the next few days and will provide the research team's contact details in case they need to get in touch or have questions.

Trial onboarding

We will contact the participant via the participant's preferred means of communication, using the research email or phone. The message will include a welcome greeting, a downloadable digital copy of the Participant Information Sheet, their SCHOUSE participant ID, their Intake24 username and password, and instructions on what to do next.

Participants will then download the Avicenna Research app (henceforth referred to as "the app") to their smartphone or tablet and create an account using their name and email address. The app will then ask the participant to enable notifications and to enter a study code, which we will provide. On the app's home screen, the participant will see two tasks ready for completion. These will be the baseline questionnaire and the link to the first dietary recall.

If a participant contacts the research team and cannot use the app due to digital exclusion, we will offer in-person or phone support, depending on the issue. If the issue is specific to the app, we will also provide web-based versions of the questionnaires (detailed below) on Qualtrics and will prompt them to complete them via their preferred method of contact at the relevant time points.

Baseline questionnaire and dietary recalls

Participants will first complete a questionnaire on the app. The questionnaire will include sociodemographic questions that we will ask only at baseline. It will also include other measures, which we will additionally measure at the midpoint and endpoint. We expect the first questionnaire to take around 30 minutes to complete. **Table 1** documents the sociodemographic details we will collect at baseline. **Table 2** presents the measures we will collect at baseline, midpoint, and endpoint.

After completing the questionnaire, participants will complete their first 24h dietary recall using Intake24. Intake24 is a validated and widely used online dietary assessment tool that employs the 24h multiple-pass method for reporting dietary intake[19]. They will find a link to the Intake24 login page in the app and can sign in using their provided username and password. Participants will use this tool to self-report what they ate and drank in the previous day (i.e., in the 24h period preceding midnight). The next day, participants will receive an app notification requesting that they complete another Intake24 report for the previous day. The day after that, they will receive another notification asking them to complete a third Intake24 report. In total, participants will complete three consecutive days of 24h dietary recalls on Intake24 at baseline, each taking 20 minutes. Completion of baseline measures will take approximately 90 minutes in total.

Table 1 Individual and household-level sociodemographic data collected at baseline

Individual characteristics	Household characteristics
Age	Who they live with
Gender	# adults in household
Ethnicity	# children in household
Height	Ages of children
Weight	Receipt of Healthy Start
Education	Receipt of free school meals
Working status (12m)	Household income
Long-term health diagnoses	Food insecurity status (12m)
Disability status	Use of emergency food support (12m)
Quality of life (health-related)	Use of community food projects (12m)
Alcohol use	Lifetime use of Queen of Greens
Tobacco use	Lifetime receipt of Rose vouchers
	Factors influencing where to shop for food

Table 2 Individual and household-level data collected at baseline (B), midpoint (M) and endpoint (E)

Individual characteristics	Household characteristics
Working status (7d)	Changes in household income (3m) (*M+E*)
Mode of transport for food shopping	Food insecurity status (30d)
Barriers to accessing food	Use of emergency food support (3m)
Self-efficacy in affording a healthy diet	Use of community food projects (3m)
Daily portions of fruit and vegetables	Use of Queen of Greens in own area (*M+E*)
Liking of fruit/vegetables	Use of Queen of Greens outside of area (*M+E*)
Barriers to fruit and vegetable consumption	Weekly spend on fruit and vegetables
Life satisfaction (*B+E*)	Daily portions of fruit and vegetables of eldest child *(if app.)*
Depression, anxiety and stress	Use of support services (6m) (*B+E*)
Loneliness	
Sense of community	
Social support	
Satisfaction with/trust in housing provider	
Use of health services (6m) (*B+E*)	

If a participant misses a report, the research team will contact them (using their preferred method of contact) to prompt them to complete a report on a different day, maximising our chances of obtaining three days of dietary reporting for each participant at baseline. Each participant will have a one-week grace period to complete all three of their 24h dietary reports, starting from the day they complete their baseline questionnaire. After this period expires, we will stop sending prompts.

We will ask participants to complete the baseline questionnaire and dietary recalls as soon as we can after receiving their screening questionnaire responses. As the recruitment period will run over several weeks, not all participants at a site may complete the baseline questionnaire and dietary recalls in the same week. This is to minimise participant attrition at the early stages of the project. However, because the intervention will start for everyone at the same site at the same time, all participants at a site will have the same trial start date. All participants must complete the baseline questionnaire and at least two 24-hour recalls before the trial starts.

Midpoint questionnaire and dietary recalls

The app will send participants a series of notifications 11 weeks after the trial has started at their site. The first notification will ask them to complete a questionnaire in the app (the measures are presented in **Table 2**), and we expect it to take approximately 20 minutes. The second notification will ask them to complete a 24h dietary recall using Intake24. The next day and the day after, the participant will receive two further notifications from the app asking them to complete two additional 24h dietary recalls. In total, participants will complete three consecutive days of 24h dietary recalls on Intake24 at midpoint. Completion of midpoint measures will take approximately 80 minutes in total.

We will prompt participants about missed recalls as we did at baseline. If a participant does not complete the questionnaire and dietary recalls in week 11, they will have two weeks to do so, starting on the day they receive the questionnaire notification. After this period has expired (i.e., at the beginning of week 11), we will stop sending prompts. We will cap this period at two weeks to maximise the temporal distance between the midpoint and endpoint measures for all participants.

Endpoint questionnaire and dietary recalls

The app will send participants the same series of notifications sent at the midpoint, 22 weeks after the trial started at their site (four weeks before the interventions are due to end); thus, participants will complete a questionnaire and three 24h dietary recalls at the endpoint. This timing should allow enough time for all participants to complete their endpoint measures before the intervention ends, thereby minimising the risk of capturing participants returning to baseline rather than the trial's impact. Completion of endpoint measures will take approximately 80 minutes in total.

If a participant does not complete the questionnaire and dietary recalls in week 22, they will have until the end of the intervention period to do so. After this period has expired (i.e., at the beginning of week 26), we will stop sending prompts. We will specify a longer completion window at the endpoint than at baseline (one week) or midpoint (two weeks) to maximise the number of participants with baseline and endpoint data.

Additional brief questionnaire on intervention use

At two random times (one between baseline and midpoint, one between midpoint and endpoint), participants will receive a notification from the app prompting them to answer a multiple-choice question, "Have you visited the Queen of Greens in the last week? [*Options*] Yes; No, but someone went on my/my household's behalf; No". This is to assess intervention use between data collection time points.

Debrief

As participants will be answering questions about their mental wellbeing, experiences of food insecurity and other health and material hardships, we will share short debriefing materials after each questionnaire, signposting participants to local and national services for mental health, food support, and financial support.

Additionally, in acknowledgement of the trial's focus on dietary change, at the end of the trial, participants will be signposted to information on healthy eating, should the trial have sparked questions about how to improve their dietary intake.

Interventions

Comparator (Signposting)

The comparator condition for the trial is similar to "usual care". Housing associations typically signpost tenants to community food initiatives through direct communication with dedicated housing officers or health and wellbeing staff. If required, they may provide referrals for specific projects (i.e., food bank referrals). They also signpost to welfare and benefits advice, debt support, and other forms of financial support via newsletters and social media. During our trial, partner housing associations will proactively provide this information to all participants (who are also their customers) every four weeks via email or WhatsApp bulletins. When participants sign up for the trial, they will consent to receive this information.

The bulletins will be sent to all trial participants. However, participants in the Comparator arm will not receive any other interventions beyond the bulletins. The research team will contact participants in this arm the Monday before the trial wave begins to inform them which arm their site is in and what to expect regarding the bulletins.

Intervention 1 (Queen of Greens)

In addition to receiving the bulletins outlined above, participants living in sites selected to receive Intervention 1 will have the opportunity to shop at a mobile greengrocer, who will begin making new weekly stops in their neighbourhood (i.e., within 1km of where they live). The Queen of Greens is a mobile greengrocer service running a timetable of weekly stops across Liverpool and Knowsley in the North West of England. It sells fresh fruit and vegetables, purchased fresh from the wholesaler, from converted buses/vans that double as mobile shops, which customers can board to do their shopping. Anyone can shop at the Queen of Greens, and they accept Healthy Start vouchers and Alexandra Rose vouchers at all their stops.

In the first week of the trial, participants will be encouraged to visit the Queen of Greens bus to receive a free tote bag. Participants who cannot collect the tote bag from the bus in the first week will have it delivered to their home address. To encourage repeat shopping on the bus, each tote bag will contain a stamp card. Each time a participant shops on the bus in the following weeks and brings their tote bag to carry their shopping, the bus driver will stamp their card after they make their purchase. They can collect a maximum of one stamp per week, up to a maximum of four stamps. Once they have filled their stamp card, they will receive a monetary voucher to spend on the bus the following week (expected value of up to £5). Vouchers must be spent before Week 8 of the trial, to minimise the impact that the voucher has on dietary measures collected at midpoint (Week 11).

The bus will be at each stop for 45 min to 1 h per week in each site. Apart from a two-week break over the Christmas and New Year period when the wholesaler closes (see "Breaks in intervention delivery" below for further details), the Queens of Greens bus will stop at the same time every week for 26 weeks as part of the trial. It will be at the Queen of Greens' discretion whether they continue these stops after the trial concludes.

The Monday before the trial wave begins, the research team will contact participants to tell them about the bulletins they will receive, how the Queen of Greens works, the new Queen of Greens stop and the tote bag/stamp card incentive. Participants will also be invited to follow the Queen of Greens on social media to receive updates on any changes to timetables or schedules. In the bulletin from their housing association, participants will receive a reminder of the day and time the Queen of Greens will be stopping in their neighbourhood.

To generate broader interest in the Queen of Greens in the community and encourage wider use beyond trial participants, we will deliver flyers to households near the new stop at the start of the trial to advertise its launch. During the trial, the Queen of Greens will also carry flyers with details about the current trial, in case customers who are not trial participants ask what is going on.

In summary, throughout the trial, the Queen of Greens mobile greengrocer will:

- Stop at a regular time and place for 45-60min each week in intervention site locations,
- Enable customers to buy fruit and vegetables on the bus priced in 50p increments,
- Not require membership or regular use,
- Make pricing clear for each type of item,
- Keep customers up to date via their social media on timetable changes,
- Take customer preferences and requests into account,
- Manage the queue so that the bus is not too crowded with customers (i.e., only 3 people on the bus at a time),
- Occasionally provide bundles of free, fresh herbs for customers, and
- Occasionally provide recipe cards for customers.

Intervention 2 (Queen of Greens + Rose vouchers)

In addition to receiving everything in Intervention 1 (bulletins and a new weekly Queen of Greens stop in their area), participants in sites randomised to Intervention 2 will receive Rose vouchers to purchase fresh fruit and vegetables at the Queen of Greens. The Alexandra Rose Charity provides Rose vouchers, which can be used to purchase fresh fruit and vegetables from market traders. In Liverpool, Rose vouchers can only be redeemed on the Queen of Greens.

Participants will receive one batch of four bundles of vouchers by postal delivery every four weeks (one bundle per week) for the duration of the trial. Over the 26-week trial, participants will receive 7 batches: 6 deliveries with 4 bundles (24 weeks of vouchers) and 1 delivery with 2 bundles (2 weeks of vouchers). Each bundle will include a note indicating when the participant should spend their vouchers and when they can expect their next bundle. Whether Rose vouchers are hand-delivered to a participant's address or sent via the postal system depends on the approach their housing association chooses.

We will encourage weekly use, but participants will have at least four weeks to use the vouchers they receive in a delivery. Each participant will receive £6 of Rose vouchers per week, plus an additional £2 for each additional member of their household; thus, the weekly voucher value will vary between participants, as dictated by their household size. We will assess household size using the number of children and adults that participants report being "usually" part of their household in the baseline questionnaire ("usually" is defined as staying with them for 2 or more nights per week). We will not verify household size and composition with the housing associations, as we expect participants to respond honestly to these questions, given their knowledge of the housing associations' involvement in the trial. Researchers will register participants in Alexandra Rose Charity's digital voucher system, but housing association staff will distribute Rose vouchers to their customers who are trial participants due to receive Intervention 2.

On the Monday before the trial wave begins, the research team will contact participants to inform them that they will receive vouchers to spend at Queen of Greens for the duration of the trial and explain how the vouchers will be distributed and redeemed. They will also provide Intervention 2 participants with the same information about the bulletins and the Queen of Greens that will be sent to Comparator and Intervention 1 participants.

If participants indicate that they no longer want to participate in the trial, they will no longer receive vouchers. Otherwise, vouchers will continue to be sent to participants, even if (i) there is evidence that participants are not using them and/or (ii) participants do not complete a study midpoint or endpoint questionnaire or dietary recall.

In summary, Rose vouchers:

- Can only be redeemed on the Queen of Greens mobile greengrocer in Liverpool (they are not accepted elsewhere),
- Should only be spent by the household to which they are issued,
- Are paper vouchers that are tracked; if lost and not spent, can be voided, and new vouchers can be issued,
- Are only available in £1 denominations and the whole £1 must be redeemed at once (at the Queen of Greens, products are priced in multiples of 50p, so a participant can spend the full value of each voucher),
- Have a ‘use by’ date, which is roughly one month after the voucher is issued (while this is not enforced, it is in place to encourage regular spending),
- Are scanned ‘out’ by the issuing authority (e.g., housing associations) and scanned ‘in’ by the retailer on use (e.g., Queen of Greens), enabling voucher use to be tracked and retailers to claim payment for the vouchers received from Alexandra Rose.

Breaks in intervention delivery

The Queen of Greens are unable to operate over the Christmas and New Year period (approximately Monday 21st December 2026 - Monday 4th January 2027) as their wholesale supplier closes for this duration. Further, staffing capacity at the housing associations is likely to be significantly reduced during this period, which will significantly hinder trial delivery.

For any trial waves that include this window (Trial Waves 1-3), we will treat the period as a two-week pause in the trial at all affected sites, regardless of intervention allocation. Thus, we will not distribute bulletins in this period, nor will the Queen of Greens visit sites allocated to Intervention 1 or 2. In sites which are affected by this pause, we will extend the trial by two weeks and treat the pause in intervention delivery as a pause in the trial timeline (i.e., midpoint and endpoint data collection will also be pushed back by two weeks). However, to minimise harm that may result from an abrupt stop to Rose vouchers provision mid-trial, we will provide any participants receiving Rose vouchers with an additional two weeks' worth of vouchers in the batch preceding the pause, along with clear guidance on when the additional vouchers can be spent and information about the break in provision.

Measures and outcomes

Appendix A (at the end of this document) contains the questionnaires used at baseline, midpoint and endpoint.

Descriptive variables

We will collect the following descriptive variables in the baseline questionnaire to describe our trial population and assess its representativeness of the sites where we are working. Participants will report their **age**, **gender**, and **ethnicity**, along with their **height** and **weight** (they will choose the units for each). We will ask about participants' household composition (**who they live with**, the **number of adults and children** in the household, and the **children's ages**), which will also enable us to calculate the total value of the Rose vouchers they will receive each week. Participants will report their **working status (12-month reference period)**, **household income** (weekly or monthly, depending on their preference), and whether they have any **long-term mental or physical health conditions**. We will ask whether any of these conditions limit their ability to carry out day-to-day activities to establish their **disability status**. Using a 12-month reference period at baseline, we will assess **food insecurity status** (U.S. Adult Food Security Survey Module (10-items)[20]), **frequency of use of emergency food support** (e.g., food parcels from food banks), and **frequency of use of community food projects** (e.g., food pantries, community kitchens).

Furthermore, for participants living in households with children, we will ask whether they **receive Healthy Start payments** and how many (if any) of the children have **access to free school meals**. These data will help us understand which existing policy-backed interventions the household is already accessing, explore whether use of such programmes influences the participant's engagement in the WP2 interventions, and, if so, the extent of their participation. We will conduct these analyses to support our own research objectives and the policy-focused analytical requirements of our delivery partner, the Alexandra Rose Charity. We will also ask participants about **factors that influence their decisions about where they shop for food** to support qualitative findings from WP1 and co-design workshop outputs from WP2.

At baseline, midpoint and endpoint, we will ask participants to report their **working status for the last 7 days**. This will allow us to understand the participant's current employment status throughout the trial, so we can assess how it (and potentially working patterns) affects engagement with the interventions. In the midpoint and endpoint questionnaires, we will ask if a participant's **household income has changed in the last three months**. If they respond positively, we will ask for their current household income. Such information will allow us to track the stability of participants' household financial situations throughout the trial and, if required, explore whether household-level financial precarity affects engagement with the intervention.

WP3 will require the following variables at baseline for modelling trial efficacy in Liverpool and England: age, gender, ethnicity, height, weight, household composition, household income, **level of education**, working status, food insecurity status, **diagnoses of physical and mental health conditions**, disability status, **alcohol use** (measured using the first two questions from the AUDIT questionnaire[21]), and **tobacco use** (asked in a way that enables us to establish accumulated pack-years).

Primary outcome

The primary outcome will be the **average daily amount (g) of fruit and vegetable intake at endpoint**, calculated from the 24h dietary recalls on Intake24. This measure will allow us to assess the impact of the interventions on fruit and vegetable intake after approximately six months of exposure.

Secondary outcomes

We will also calculate our primary and secondary outcomes at midpoint to assess any temporal patterns in response to the interventions that examining only endpoint values may miss. The **average daily amount (g) of fruit and vegetable intake at the midpoint** will be a key secondary outcome, as it will enable us to assess the trial's effectiveness on our key variable of interest over time.

Dietary measures

Using dietary data from Intake24, we will calculate **the average daily intake of energy** (kcal), **macronutrients** (carbohydrates, protein, fat; g), and **fibre** (from AOAC; g) at endpoint. From these data, we will also calculate how many **portions of fruit and vegetables** participants consumed at endpoint according to the UK's 5-a-day guidelines.

We will also ask participants **to self-report how many portions of fruit and vegetables (separately) they consume on a typical day** at baseline, midpoint, and endpoint. Similarly, if a participant lives in a household with children, we will ask **how many portions of fruit and vegetables (separately) their eldest child eats on a typical day** at baseline, midpoint, and endpoint. If the eldest child is not yet eating solid foods, the participant can select that option. The questions are based on survey items previously used by the Alexandra Rose Charity to ensure comparability of the data between organisations.

Measures assessing access to food and food spending

At each time point, using a **30-day reference period**, we will assess **food insecurity status** (again using the U.S. Adult Food Security Survey Module (10-items)[20]), **frequency of use of emergency food support** (e.g., food parcels from food banks), and **frequency of use of community food projects** (e.g., food pantries, community kitchens). We are asking these questions throughout the trial to assess whether the trial itself affects household food insecurity and a household's use of emergency food support and community food projects, which will be signposted in bulletins provided by housing associations in all three groups.

We will also ask about the **mode of transport participants use to get to where they buy food** and any **barriers to food access** (other than financial) they face at all three time points. The suggested responses and statements we provide for both questions are informed by qualitative work conducted by the research team in other studies and by input from this project's Community Engagement in Research Panel. Similarly, we will ask participants about **potential barriers they face in buying, cooking and eating fresh fruit and vegetables** (using questions adapted from an existing study[22]). We are asking these questions to assess whether the interventions affect commonly reported barriers to food access and to fruit and vegetable consumption within the communities we are working with. If the interventions have a positive impact on diet, the results from these questions will help us untangle potential mechanisms of their operation.

At baseline, midpoint, and endpoint, we will ask participants to estimate **how much their household spends per week on fresh fruit and vegetables** at the Queen of Greens and elsewhere, excluding any purchases made with Healthy Start payments and Rose vouchers. This question aims to examine if (a) Queen of Greens increases money spent on fresh fruit and vegetables from baseline, and (b) participants receiving Rose vouchers further increase their spending on fresh fruit and vegetables beyond just their Rose voucher spending. We believe increased spending on fresh fruit and vegetables will be a strong indicator that participants have changed their dietary habits and, potentially, their preferences because of the interventions.

To track Queen of Greens usage across the trial population, we will ask participants **how frequently they have visited the Queen of Greens in their area** (within 1km of where they live) in the last three months, and **how frequently they have visited the Queen of Greens outside of their area** (further than 1km from where they live) in the last three months. We are asking about the latter to understand whether participants receiving an intervention are likely to visit another stop farther from their home simply because the intervention has introduced them to the Queen of Greens. Participants may do this if, e.g., there is a stop near their place of work or the timing of the stop in their area is inconvenient. We will ask participants in both the comparator and intervention arms these questions at midpoint and endpoint. At baseline, we will

ask participants **whether they have ever visited Queen of Greens**. Because Queen of Greens has operated in Liverpool for many years and has an established timetable, some participants may have visited other Queen of Greens stops in the past and may still visit them regularly. Having this information will enable us to calculate the proportion of our sample who will access Queen of Greens for the first time during the intervention. Similarly, at baseline, we will ask **whether their household has received Rose vouchers in the past**, as Rose vouchers have been distributed to eligible families in Liverpool for several years previously.

Psychological measures related to food

We expect that, if the interventions improve the affordability and availability of fresh fruit and vegetables, then they may help people feel more **confident about their ability to afford the fruit and vegetables their household needs to eat a healthy diet**. A change in self-efficacy may occur even without a measurable dietary change; therefore, we are asking participants to rate how confident they feel about this at baseline, midpoint, and endpoint so we can track changes throughout the trial. While we have designed this question, it is structured as questions typically are when asking about self-efficacy.

Participants will also rate their **liking of fruit and vegetables** at baseline, midpoint and endpoint. They will do this separately for fruit and vegetables, as in fruit and vegetable intake interventions, it is common for fruit intake to increase, but not vegetables[23]. These are more measures that may help us unpick how the interventions are working, as we might expect that increased exposure to a wider variety of fresh fruit and vegetables during the trial will increase participants' liking of them generally, and make it more likely that they would increase their intake (if other barriers, such as affordability, are also removed). Again, we have designed these questions in line with question structures typically used to examine food liking.

Mood and wellbeing

To measure potential impacts of the interventions on mood and wellbeing, participants will complete the **Depression, Anxiety and Stress Scale** – 21 items (DASS-21)[24] at baseline, midpoint and endpoint. We will analyse how each intervention affects the overall DASS-21 but also the subscales (stress, anxiety and depression).

Loneliness, social support and community

During co-design workshops, both stakeholders and community members identified that social isolation, lack of social support, and a poor sense of community significantly impact people living in the areas where we will be working. They also proposed that the interventions may help improve these factors, as there will be a local place people can go to engage with others in their neighbourhood regularly. Consequently, we will measure these variables using validated tools at baseline, midpoint, and endpoint to establish whether the intervention has impacts beyond dietary outcomes. To measure loneliness, we will use the **three-item UCLA loneliness scale** and a **direct measure of loneliness** as recommended by the Office for National Statistics[25]. Further, participants will complete the **Oslo Social Support Scale** (OSSS)[26] to assess the level of social support that they feel they have access to. Lastly, we will use the **Brief Sense of Community Scale** (BSCS)[27] to investigate how participants feel about their neighbourhood in the following domains (which also form four 2-item subscales): needs fulfilment, group membership, influence, and emotional connection.

Trust in housing provider and accessing support services

Community members and stakeholders indicated during co-design workshops that relationships between tenants and housing providers are often difficult or strained. Given that housing associations are taking an active role in supporting and delivering positive initiatives at the trial sites, we want to explore whether this changes participants' perceptions of their housing provider over the course of the trial. To do this, at

baseline, midpoint, and endpoint, we will ask three questions from the **Tenant Satisfaction Measures** (TSM)[28], regarding tenants' **overall satisfaction with their housing provider**, how much tenants **feel their housing provider listens to them and acts on their needs**, and tenants' **satisfaction that their housing provider positively contributes to their neighbourhood**. The Government requires landlords with over 1000 properties to report on their TSM results, so housing associations are familiar with these measures and use them regularly. Thus, our results will be directly comparable to their existing data on these measures, making them both more useful within a housing association and more generalisable beyond it.

Finally, to assess whether the intervention altered how participants engaged with a broad range of support services (e.g., financial, housing, council), at baseline and endpoint, we will ask participants to select from a list **any support services they have accessed within the last six months**. Participants will also have the option to enter any services not listed.

WP3 outcome variable requirements

To inform their models, WP3 requires a measure of **quality-adjusted life years** (QALYs; as measured by the EQ-5D-5L[29]) at baseline, midpoint, and endpoint, as well as wellbeing-adjusted life years (WELLBY; as measured using a question about life satisfaction [30]). Health economists use QALYs and WELLBYs to estimate the health and social value, respectively, resulting from a program, or in our case, an intervention. WP3 also requires a **Client Service Receipt Inventory (CSRI) of health services** participants accessed in the last six months at baseline and endpoint, to calculate the cost associated with using these services. There is no standardised approach to asking the CSRI question to collect the information WP3 required; thus, we let their needs guide how we posed it.

Randomisation

As we are conducting a clustered randomised controlled trial, we will randomise at the cluster level. In the present trial, each of our 12 trial sites is a cluster. We will randomise the 12 sites to the three intervention arms in blocks of four using the randomizr package[31] in RStudio. Each of the four blocks will correspond to the four waves of trial rollout (Figure 1). The sites in the first block (as determined by the order of the randomisation list) will become the sites in the first wave (Trial Wave 1), and so forth for the following blocks and waves.

We will randomise sites once a suitable place for the Queen of Greens bus to stop is identified at each site, so feasibility of delivering the intervention at all sites is established before randomisation. This approach minimises the potential for systematic differences to emerge between sites regarding their suitability to host a stop.

Blinding

Due to the nature of the interventions, it is not possible to blind researchers, delivery partners, and participants during the trial. Everyone must know what interventions are being offered in each area for them to be delivered. However, there are opportunities to blind recruitment and the period before the trial begins at a site. We aim to have as few people as possible know which intervention a site will receive until as close to the intervention's start at that site as possible.

Four key groups of actors could be blinded to the allocation of interventions in the present trial: researchers, Queen of Greens, housing association staff and/or recruitment partners, and participants. Given the trial's design and the oversight required across multiple partners, the research team cannot be blinded to intervention allocation. Similarly, because of the planning required (e.g., bus routes, timetables, staffing, and stock), it is not feasible for the Queen of Greens team to be blinded to site allocation to interventions.

Consequently, for both the research team and the Queen of Greens team, knowledge of site randomisation to interventions will be limited to staff who need to know for planning and delivery purposes. Within the research team, the knowledge will be kept within WP2. Within Queen of Greens, we will ask that the knowledge be kept between the Director and the Project Manager for as long as possible, or until input from one of their drivers is required.

Feedback from our housing association partners suggests they need to know as early as possible when each site will start the trial. We have agreed that once we have randomised the sites, we will share with them which sites are in each wave, but we will not share which sites are receiving which intervention. This will allow the partners to plan the staff resources they require for each wave. Then, a month before a wave begins (i.e., at the start of the recruitment period for those three sites), we will inform housing association managers of the intervention allocations for that wave. These managers will oversee the staff recruiting for the trial but will not recruit for it themselves. This will maximise the time housing association partners have to plan their delivery staff's workloads and minimise the influence this knowledge may have on recruitment to the trial. For example, if community figures, such as housing officers, are involved in recruitment and they know which intervention a site is due to receive, it could influence how they engage with recruitment practices, e.g., they may selectively speak to individuals who they think will benefit from the specific intervention the site is due to receive. Such resulting changes in partner behaviour, even if unintentional, could lead to differences in sampling strategies between sites and, ultimately, in who is taking part across sites. Even if these biases in recruitment practices are unintentional, they can be difficult to prevent and account for after they have occurred. It is more robust for our recruitment partners to be blind to a site's intervention allocation for as long as possible while recruiting participants at that site. Therefore, we will plan to unblind our recruitment partners at the earliest opportunity arising from either (i) when all participants have been recruited to a wave, or (ii) two weeks before the interventions are due to start in that wave.

Participants will be told which intervention they are due to receive the week before it is due to start in their area. Our goal is to minimise, if not eliminate, the possibility that knowledge of which intervention a site will receive can spread within a site during the recruitment phase. If potential participants knew which intervention they would receive when they signed up, this might influence who chose to sign up. Such influences could lead to systematic differences between samples across sites – different interventions may attract different sample demographics. By keeping recruitment partners, the participant pool and participants blind to intervention allocation for as long as possible before interventions begin in an area, we minimise the risk that information leaks into the community before recruitment is complete, and that knowledge of intervention allocation unintentionally influences who signs up.

Sample size

To estimate our required sample size, we conducted *a priori* power analyses (RStudio, with packages simr[32], lme4[33] and lmerTest[34]) using a linear mixed model with endpoint fruit and vegetable intake (g/d) as the outcome, trial arm and baseline fruit and vegetable intake (g/d) as fixed effects, and site as a random effect. Because we will run pairwise comparisons between Control and Intervention 1 and between Intervention 1 and Intervention 2, we applied a Bonferroni correction and set alpha at 0.025.

We made the following assumptions and adjustment calculations:

- **A between-group difference of 92 g/d** – if the interventions increase the fruit and vegetable intake of people living in social housing to that of those with mortgages or who own their properties outright (based on our analysis of Health Survey for England 2022 data); such a difference would demonstrate a significant reduction of this particular nutritional inequality in this specific population.

- **A standard deviation (SD) of endpoint fruit and vegetable intake (g/d) of 136 g** – data from the 2019-2023 UK National Diet and Nutrition Survey (NDNS) suggest that the SD of daily fruit and vegetable intake in the lowest income decile is 1.7 portions (1.7 x 80 g = 136 g).

- **An expected correlation of 0.7 between baseline and endpoint fruit and vegetable intake** – we anticipate a strong relationship between these two variables. Still, we could not find existing data to suggest a value outside a published conference abstract, which reported 0.7 [35]. This value reflected our expectations of a strong relationship between baseline and endpoint fruit and vegetable intake, so we retained it. We then **adjusted the residual variance accordingly to 97 g** (calculated as SD × $\sqrt{(1-r^2)}$ = 136 × $\sqrt{(1-0.49)}$).

- **An intracluster correlation coefficient (ICC) of 0.03** – This is an ICC value considered typical of clustered randomised controlled trials[36].

With these specifications, 12 clusters of n = 30 would yield over 98% power with a two-sided alpha level. Even assuming a high attrition rate of ≈ 33% per cluster, we would retain over 90% power.

Statistical analysis

Data handling and statistical analyses will be conducted in RStudio.

To assess between-arm differences in endpoint fruit and vegetable intake (g/d), we will use a linear mixed model with trial arm and baseline fruit and vegetable intake (g/d) as fixed effects, and site as a random effect. If the model produces a significant result (i.e., $p < .05$), we will conduct follow-up pairwise comparisons of estimated marginal means (EMMs) to compare Control and Intervention 1 and then Intervention 1 and Intervention 2 (using a threshold of $p < .025$ to adjust for multiple comparisons).

All other analyses will be exploratory but will follow a similar approach to that described above, including baseline values of the relevant variable as a fixed effect.

Data management

We will store contact details separately from data collected later in the trial. We will create an anonymisation key that links a participant's name and contact information to their SCHOUSE participant ID (researcher-provided), their Avicenna Research ID (automatically assigned by an app), and their Rose voucher ID (researcher-provided, only for participants allocated to the group receiving Rose vouchers). The anonymisation key will be stored as a password-protected database. It will be kept in a SharePoint folder in a private Teams Channel, accessible only to University of Liverpool researchers who require the contact information to fulfil their duties.

Researchers will provide participants with a study code to input into the Avicenna Research app. Once participants have joined the study on the app, they will be asked to enter their SCHOUSE participant ID. This will allow us to link the unique ID that Avicenna generates for a participant to their SCHOUSE participant ID and the contact information stored in the anonymisation key. For Intake24, participants will receive login details from the researchers. Their username will be their SCHOUSE participant ID, allowing us to link participants' Intake24 data to the rest of their study data. We will use the anonymisation key to check that participants have completed the necessary tasks and to send them the reimbursement they are due. Trial data from questionnaires and dietary recalls will be stored pseudonymised in the SharePoint folder in the aforementioned Teams Channel. Data will be frequently downloaded from the data collection platforms (at least once a month) and backed up to the SharePoint folder.

The PIS will inform participants that they can request deletion of their data up to 28 days after they stop participating in the trial. Study data collected via Intake24 and Avicenna Research will be deleted from each platform once the research team has downloaded and backed up all study data at the end of the trial. These platforms do not store data elsewhere, so at this stage, they will no longer hold any study data. Once data collection is complete and trial data from all platforms and timepoints are linked, we will replace the SCHOUSE participant ID, their Avicenna Research ID and their voucher ID with a single unique identifier and delete the SCHOUSE participant ID from the trial datasets. At this stage, data will be fully anonymised, and we will not be able to identify an individual participant's data for removal. The University of Liverpool research team will also lose the ability to link individuals to their data at this stage. Anonymised data will be stored for 10 years, in accordance with UKRI funding requirements, using the methods described above. The anonymised datasets will also be made publicly available on an open research repository following the peer-reviewed publication of the results; we will ensure that individuals cannot be identified from the uploaded information.

During the baseline questionnaire, participants will report whether they would like us to retain their contact information after the trial so that we can send them a study report of our findings. If a participant responds with no, we will delete their contact details from the anonymisation key approximately 6 months after data collection is complete. If a participant responds positively, we will retain their contact information in the anonymisation key until the study report is ready for dissemination, approximately one year after data collection is complete. Once we have sent the study report, we will delete all remaining contact details and personally identifiable information from our records in the SharePoint folders. At this stage, we will not store any personally identifiable information.

During the trial, contact details (name, email address, phone number) for each participant will be shared with their housing association to enable the housing associations to deliver the interventions as part of the trial. Participants give explicit consent to share these data when signing up to take part, and we have data-sharing agreements in place with each housing association to cover these activities. Housing associations will only receive information about participants who are their customers. Housing associations will only receive the home addresses of participants who will receive vouchers by post to spend on the bus. Further, they will not have access to voucher-tracking or spending data from Alexandra Rose Charity; this will be available only to the University of Liverpool research team. We will share the contact details via password-protected files using SharePoint on the previously mentioned Teams Channel. Recipients will be granted permission to access only the specific file that they need, not the Teams Channel itself. These files will be deleted once data collection is complete.

Dissemination of results

The results of the trial will be published in peer-reviewed scientific journals, and the anonymised data will be made available on an open-access repository. We will also actively engage with stakeholders and policymakers to disseminate the trial findings by hosting an interactive workshop based on the trial reports and briefings.

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Appendix A

On the following pages, we have provided the questionnaires that participants will complete digitally and remotely at baseline, midpoint and endpoint.

[*Baseline]*

Introduction to questionnaire

Thank you for taking part in this research study. **This questionnaire is the first study activity** we will ask you to complete over the next 6 months. This will be the longest questionnaire you complete during the study. We expect it will take you **around 30 minutes**, but some people may take less time.

Please read the information below carefully before continuing.

To continue participating in the study, you must complete this questionnaire. Please answer each question as carefully and as honestly as you can. If you do not wish to answer a question, you may skip it.

Since **you will receive vouchers for completing this questionnaire**, we need to keep things fair and ensure people don't rush through it. We have included **some questions to check that people are paying attention** to what they are reading and how they are answering.

Remember, **your housing association will not be able to see your answers to these questions**. Only the researchers at the University of Liverpool have access to these answers, and they will not directly link them to your name or contact information.

We are asking **a lot of questions**, and you may wonder why we need to know some of the things we're asking about, like your height, weight and information about your health. Please be assured, we are **only collecting information needed to answer our research questions and understand who is taking part.**

>> Would you like to know more about why we're asking the questions we're asking?

[*multiple choice, select one*]

- **Yes** [*takes participant to an information page titled "Why we're asking these questions" – see below*]
- **No** [*takes participant to first page of questionnaire*]

[*If selected yes above*]

Why we're asking these questions

We are only asking these questions for research purposes.

We are asking about your background, your living situation, and your household and its income to understand **how similar people taking part in the study** are to the general population.

We would also like to know this information so that we can investigate **how well the activities delivered as part of this study work for people with a variety of characteristics** (including age, gender, ethnicity, height and weight, health status, eating patterns, use of community services, opinions on their housing provider, and household characteristics).

If your area starts receiving fruit and vegetable vouchers as part of the study, we will also use the information you provide about your household to work out **how many vouchers to send you**.

We will use information from your online food diaries and your answers to questions about your experiences and feelings about getting food, your mental wellbeing, and your community to investigate **how the activities delivered as part of this study affect these parts of people's lives**.

All the data we collect will be anonymised and then additionally used to **explore how well the study's activities might work to improve health if they were scaled up across all of Liverpool and throughout England**. To do this "modelling" analysis, we need detailed information about everyone taking part, including age, gender, ethnicity, height, weight, daily activities, health status, education, alcohol and tobacco use, use of health services, and household characteristics. These factors can influence future health, so we need to account for them when we consider how effective our study's activities might be at improving health for the whole population if they were rolled out in the future.

[Midpoint and Endpoint]

Introduction to questionnaire

Thank you for taking part in this research study. We expect this questionnaire to take you **around 20 minutes**, but some people may take less time.

Please read the information below carefully before continuing.

To receive vouchers for participating in this study this month, you must complete this questionnaire. Please answer each question as carefully and as honestly as you can. If you do not wish to answer a question, you may skip it.

Since **you will receive vouchers for completing this questionnaire**, we need to keep things fair and ensure people don't rush through it. We have included **some questions to check that people are paying attention** to what they are reading and how they are answering.

Remember, **your housing association will not be able to see your answers to these questions**. Only the researchers at the University of Liverpool have access to these answers, and they will not directly link them to your name or contact information.

We are asking **a lot of questions**, and you may wonder why we need to know some of the things we're asking about, like your height, weight and information about your health. Please be assured that we are only collecting information **needed to answer our research questions and understand who is taking part.**

We are asking **a lot of questions**, and you may wonder why we need to know some of the things we're asking about, like your height, weight and information about your health. Please be assured, we are **only collecting information needed to answer our research questions and understand who is taking part.**

>> Would you like to know more about why we're asking the questions we're asking?
[*multiple choice, select one*]

- **Yes** [*takes participant to an information page titled "Why we're asking these questions" – see below*]
- **No** [*takes participant to first page of questionnaire*]

[*If selected yes above*]

Why we're asking these questions

We are only asking these questions for research purposes.

We are asking about your background, your living situation, and your household and its income to understand **how similar people taking part in the study** are to the general population.

We would also like to know this information so that we can investigate **how well the activities delivered as part of this study work for people with a variety of characteristics** (including age, gender, ethnicity, height and weight, health status, eating patterns, use of community services, opinions on their housing provider, and household characteristics).

If your area starts receiving fruit and vegetable vouchers as part of the study, we will also use the information you provide about your household to work out **how many vouchers to send you**.

We will use information from your online food diaries and your answers to questions about your experiences and feelings about getting food, your mental wellbeing, and your community to investigate **how the activities delivered as part of this study affect these parts of people's lives**.

All the data we collect will be anonymised and then additionally used to **explore how well the study's activities might work to improve health if they were scaled up across all of Liverpool and throughout England**. To do this "modelling" analysis, we need detailed information about everyone taking part, including age, gender, ethnicity, height, weight, daily activities, health status, education, alcohol and tobacco use, use of health services, and household

characteristics. These factors can influence future health, so we need to account for them when we consider how effective our study's activities might be at improving health for the whole population if they were rolled out in the future.

ADDITIONAL DESIGN NOTES: *Participants do not need to respond to move on to the next question. To encourage responses and catch any accidental omissions, if a participant skips a question, they will see a question asking whether they meant to skip. If they say no, they will return to the question they missed; if they say yes, we will assume that they preferred not to answer that question. We are using this approach in place of "don't know" or "prefer not to say" responses for most questions, as feedback from our Community Engagement in Research Panel suggested that they did not like that respondents could complete the questionnaires by selecting one of these options throughout, as they found it unfair that people could "cheat" like that.*

As the questionnaire is long, we will also include attention-check questions at each time point to ensure participants are not rushing through without reading the questions. These attention checks will ask participants to select a particular letter, number or symbol in a multiple-choice question. e.g., Select the number 9 from the following options: 3, 10, 8, 6, 2, 9, 7.

Questions 1-18 will only be asked in the baseline questionnaire. These will be presented first.

The first set of questions will ask for basic information about **you and your circumstances**.

If you want to know more about why we're asking these questions, please refer to the Participant Information Sheet, or you can find out more at the end of this questionnaire.

1. How old are you?
   [*numerical input*]

2. Which of the following describes your gender?
   [*multiple choice, select one*]
   - Man
   - Woman
   - Non-binary
   - Describe in another way [*allows text response*]

3. Which of the following best describes your ethnic group or background?
   [*multiple choice, select one*]
   - White (including English / Welsh / Scottish / Northern Irish / British; Irish; Gypsy or Irish Traveller; Any other White background)
   - Mixed (including White and Black Caribbean; White and Black African; White and Asian; Any other mixed / multiple ethnic background)
   - Asian / Asian British (including Indian; Pakistani; Bangladeshi; Chinese; Any other Asian / Asian British background
   - Black or Black British (including Caribbean; African; Any other Black / Black British background;
   - Other ethnic group (e.g. Arab; Any other ethnic group)

4. A. The next question asks about your height. Which units would you like to enter your height in?
   [*multiple choice, select one*]
   - Feet and inches
   - Metres and cms

   B. What is your height?
   [*numerical input*]

5. A. The next question asks about your weight. Which unit would you like to enter your weight in?
[*multiple choice, select one*]
    - Stones and pounds
    - Kg

    B. What is your weight?
    [*numerical input*]

6. Please select all the qualifications you have achieved in England, Wales or worldwide, including equivalents, even if you are not using them now. We have provided descriptions of each type below, in case you need further information to help you answer.

    What we mean by "degree level or above": This is any higher education qualification, achieved in the UK or another country, at level 4 or above. Students are usually aged 18 years or over when they begin these qualifications through a college or university. Examples include level 4 and 5 qualifications, bachelor's degrees with or without honours, master's degrees, PhD or other doctorates and professional qualifications, such as a PGCE or chartership .

    What we mean by "NVQ": This is a National Vocational Qualification. NVQs are competency and skills-based qualifications that can be achieved in school, college or at work. If you have achieved similar qualifications, such as Scottish Vocational Qualifications or other vocational qualifications outside of the UK, choose the options you think are the closest match.

    What we mean by "AS and A level": These are advanced-level, subject-based qualifications that are often needed to get a place at university. Students in England and Wales usually complete AS levels by age 17 and A levels by age 18. If you have achieved similar qualifications outside of England and Wales, choose the options you think are the closest match. An International Baccalaureate diploma is equivalent to three A levels.

    What we mean by "GCSE": This is a General Certificate of Secondary Education. GCSEs are subject-based. Students in England and Wales usually complete GCSEs at school by age 16. If you have achieved CSEs, O levels or other similar qualifications outside of England and Wales, choose the options you think are the closest match.

    [*multiple choice, select all that apply*]
    - **A qualification at degree-level or above** - For example, degree, foundation degree, HND or HNC, NVQ Level 4 and above, teaching or nursing, Higher or Degree apprenticeship
    - **A Level, AS Levels, NVQ level 3 or equivalent** - For example, BTEC National, OND or ONC, City and Guilds Advanced Craft, Advanced apprenticeship
    - **GCSEs (grades A* to C or 9 to 4), NVQ level 2 or equivalent** - For example, BTEC General, City and Guilds Craft, Foundation or Intermediate apprenticeship. It also includes O level passes or CSEs grade 1.
    - **Any other GCSEs, NVQ level 1 or equivalent** - Includes any other O levels or CSEs at any grade
    - **Basic Skills course** – For example, Skills for life, literacy, numeracy and language
    - **None of these apply**
    - **Other** [*allows text response*]

7. In the last 12 months, were you doing any of the following? Please **select all** responses that apply to you.

   For example, if you were in full-time employment but have also been on maternity or paternity leave in the last 12 months, select "Working as an employee (30 hours or more per week)" **and** "On maternity or paternity leave".
   [*multiple choice, select all that apply*]
   - Working as an employee (30 hours or more per week)
   - Working as an employee (less than 30 hours per week)
   - Self-employed or freelance (30 hours or more per week)
   - Self-employed or freelance (less than 30 hours per week)
   - Temporarily away from work due to illness (with pay)
   - Temporarily laid off (without pay)
   - On maternity or paternity leave
   - Retired
   - Not working due to living with a long-term health condition or disability
   - Studying
   - Volunteering
   - Caregiving/Looking after home and/or family
   - Other (please specify) [*allows text response*]

The next set of questions will ask for basic information **about your household and your household's circumstances**. If you live alone, your household is just you.

Please answer as accurately as you can, but do not worry if you are not sure.

8. A. Who is **usually** part of your household? Please **select all** that apply.

   By "**usually**", we are referring to people who stay with the household 2 or more nights per week. If your household includes students who live away during term time, please include them here.
   [*multiple choice, select all that apply*]
   - A spouse or partner
   - Children aged 17 years old or younger
   - Other family members, including parents, anyone who is aged 18 or older, siblings and/or other relatives
   - Friends, housemates, or other people who live with you
   - None of the above - I live by myself
   - None of the above - The people who live with me aren't part of my household, and I do not share food or other essentials with anyone

   B. [*asked if household includes other adults*] Including yourself, how many adults aged 18 and over are **usually** part of your household? By "**usually"**, we mean adults who stay with the household 2 or more nights per week.
   [*numerical input*]

   C. [*asked if household includes children*] How many children are usually part of your household? By "**usually",** we mean staying with you 2 or more nights per week.
   [*numerical input*]

   D. [*asked if household includes children*] What are the ages of the children who are **usually** part of your household? By "**usually",** we mean staying with you 2 or more nights per week.
   [*Use display logic to show "Child 1", "Child 2", etc., based on how many children reported in 7C, then allow numerical input*]

E. [*asked if household includes children under the age of 4 years old*] Do you receive Healthy Start Payments?
[*multiple choice, select one*]

- Yes
- No

F. [*asked if household includes children aged 4-17 years old*] How many children in your household are receiving free school meals?
[*numerical input*]

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9. A. The next question will ask you about your household's income. How would you like to report this?
[*multiple choice, select one*]
    - Monthly
    - Weekly

    B. [*asked if monthly is selected*] From the income bands below, about how much money does your household currently receive every month, after any tax deductions and National Insurance? If you don't have additional household members, just answer for yourself.
    [*multiple choice, select one*]
    - Less than £400
    - £401 to £600
    - £601 to £800
    - £801 to £1000
    - £1001 to £1200
    - £1201 to £1400
    - £1401 to £1600
    - £1601 to £1800
    - £1801 to £2000
    - More than £2000

    C. [*asked if weekly is selected*] From the income bands below, about how much money does your household typically receive every week, after any tax deductions and National Insurance? If you don't have additional household members, just answer for yourself.
    [*multiple choice, select one*]
    - Less than £100
    - £101 to £151
    - £151 to £200
    - £201 to £250
    - £251 to £300
    - £301 to £350
    - £351 to £400
    - £401 to £450
    - £451 to £500
    - More than £500

The next set of questions will ask you about how **your household has accessed food in the last 12 months**, **the services you may or may not have used, and any barriers to food access your household might face**. If you live alone, your household is just you.

Please answer as accurately as you can, but do not worry if you are not sure. You do not have to answer questions that make you feel uncomfortable.

If you want to know more about why we're asking these questions, please refer to the Participant Information Sheet, or you can find out more at the end of this questionnaire.

10. A. Please say whether the statement below was often true, sometimes true or never true for you/people in your household in the last 12 months. Please **select one** answer only for each statement.
[*multiple choice, select one*]

I/We worried whether my/our food would run out before I/we got money to buy more

- Often true
- Sometimes true
- Never true

The food that I/we bought just didn't last, and I/we didn't have money to get more

- Often true
- Sometimes true
- Never true

I/We couldn't afford to eat balanced meals

- Often true
- Sometimes true
- Never true

B. [*asked if any answer to A is "Often true" or "Sometimes true"*] In the **last 12 months**, did you or any other adult in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?

- Yes
- No

C. [*asked if answer to B is "Yes"*] In the **last 12 months**, how often did this happen?
[*multiple choice, select one*]

- Almost every month
- Some months but not every month
- Only 1 or 2 months

D. [*asked if any answer to A is "Often true" or "Sometimes true"*] In the **last 12 months**, did you ever eat less than you felt you should because there wasn't enough money for food?
[*multiple choice, select one*]

- Yes
- No

E. [*asked if any answer to A is "Often true" or "Sometimes true"*] In the **last 12 months**, were you ever hungry but didn't eat because there wasn't enough money for food?
[*multiple choice, select one*]

- Yes
- No

F. [*asked if any answer to A is "Often true" or "Sometimes true"*] In the **last 12 months**, did you lose weight because there wasn't enough money for food?
[*multiple choice, select one*]

- Yes
- No

G. [*asked if answer to B, C, D, E, or F is "Yes"]* In the **last 12 months**, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?
[*multiple choice, select one*]

- Yes
- No

H. [*asked if answer to G is "Yes"]* In the **last 12 months**, how often did this happen?
[*multiple choice, select one*]

- Almost every month
- Some months but not every month
- Only 1 or 2 months

---

11. A. In the **last 12 months**, have you, or anyone else in your household, **received emergency food support** (e.g., a free parcel of food from a food bank or another emergency food provider)?
[*multiple choice, select one*]

- Yes
- No

B. [*asked "yes" is selected in A*] In the **last 12 months**, how many free food parcels have you, or anyone else in your household, received from a food bank or other emergency food provider?
[*multiple choice, select one*]

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- More than 12

---

12. A. In Liverpool, many community organisations allow people to buy food at a discounted price, or as part of a membership. These are different from food banks in that they do not provide emergency food support. They offer a choice of food, often provide a retail-like environment and may provide social support. Some of these spaces also provide meals for a discounted price or sometimes for free.

These community spaces have many different names, including:

- Food or community hubs
- Food or community pantries
- Food clubs or unions
- Community shops/stores/groceries
- Community fridges
- Community markets
- Community kitchens or cafes

In the **last 12 months**, have you, or anyone else in your household, **eaten, bought or received food** from one (or more) of the **community spaces** listed above?
[*multiple choice, select one*]

- Yes
- No

B. [*asked "yes" is selected in A*] **How often** in the **last 12 months** have you, or anyone else in your household, **eaten, bought or received food** from a **community space** like those listed?
[*multiple choice, select one*]

- Every day
- Most days
- 2-3 times a week
- About once a week
- 2-3 times a month
- About once a month
- Every other month
- Once every few months
- Twice in 12 months
- Once in 12 months

13. Have you ever received Rose vouchers? These are vouchers provided by Children's Centres and refugee centres for families with children aged 4 or younger. They can be used on the Queen of Greens.
[*multiple choice, select one*]

- Yes
- No

14. When deciding where to do your food shopping, how much does each of the following matter to you?

	Not at all	A little	A lot
A. The cost of food in a particular shop	○	○	○
B. The quality of food in a particular shop	○	○	○
C. The availability of foods that you and your household like or need to eat	○	○	○
D. The amount of time I have available to do my shopping	○	○	○
E. The cost of travel to get there and back	○	○	○
F. The cost of delivery of food shopping	○	○	○
G. Carrying heavy bags back home from the shops	○	○	○
H. The availability of someone to take me to the shops	○	○	○
I. Physical/mental health difficulties associated with travelling to the shops	○	○	○
J. Physical/mental health difficulties associated with being in and moving around the shops	○	○	○

The next set of questions asks about **your health**. You should answer these questions about yourself, not about other people in your household. Please answer as accurately as you can, but do not worry if you are not sure.

15. A. Have you been diagnosed with a **long-term** physical or mental health condition or illness? By "**long-term**", we mean lasting or expected to last for 12 months or more.
[*multiple choice, select one*]
    - Yes – physical condition
    - Yes – mental health condition
    - Yes – both physical and mental health conditions
    - No

    B. [*asked if any "yes" option is selected in A*] You've indicated you have one or more long-term physical or mental health conditions or illnesses. Does this/do they reduce your ability to carry out day-to-day activities?
    [*multiple choice, select one*]
    - Yes, a lot
    - Yes, a little
    - Not at all

    C. [*asked if any "yes" option is selected in A*] Have you been diagnosed with any of the following conditions or illnesses? Please **select all** that apply.
    [*multiple choice, select all that apply*]
    - Type 2 diabetes
    - Coronary heart disease
    - Stroke
    - Lung cancer
    - Breast cancer
    - Colorectal cancer
    - Prostate cancer
    - Other cancers
    - COPD (Chronic Obstructive Pulmonary Disease)
    - Asthma
    - Atrial fibrillation
    - Heart failure
    - Hypertension (High blood pressure)
    - Irritable Bowel Syndrome
    - Inflammatory Bowel Disease (including Crohn's Disease and Ulcerative Colitis)
    - Constipation
    - Type 1 diabetes
    - Dementia or Alzheimer's Disease
    - Anxiety
    - Depression
    - Psychosis
    - Bipolar disorder
    - Alcohol dependency
    - Epilepsy
    - Chronic Kidney Disease
    - Chronic pain
    - Rheumatoid arthritis
    - Other connective tissue disorders
    - Hearing loss
    - Other [*allows text response*]

16. A. Please choose the ONE answer that best describes your health TODAY.
[*multiple choice, select one*]

- I have no problems in walking about
- I have slight problems in walking about
- I have moderate problems in walking about
- I have severe problems in walking about
- I am unable to walk about

B. Please choose the ONE answer that best describes your health TODAY.
[*multiple choice, select one*]

- I have no problems washing or dressing myself
- I have slight problems washing or dressing myself
- I have moderate problems washing or dressing myself
- I have severe problems washing or dressing myself
- I am unable to wash or dress myself

C. Please choose the ONE answer that best describes your health TODAY.
[*multiple choice, select one*]

- I have no problems doing my usual activities
- I have slight problems doing my usual activities
- I have moderate problems doing my usual activities
- I have severe problems doing my usual activities
- I am unable to do my usual activities

D. Please choose the ONE answer that best describes your health TODAY.
[*multiple choice, select one*]

- I have no pain or discomfort
- I have slight pain or discomfort
- I have moderate pain or discomfort
- I have severe pain or discomfort
- I have extreme pain or discomfort

E. Please choose the ONE answer that best describes your health TODAY.
[*multiple choice, select one*]

- I am not anxious or depressed
- I am slightly anxious or depressed
- I am moderately anxious or depressed
- I am severely anxious or depressed
- I am extremely anxious or depressed

F. We would like to know how good or bad your health is TODAY. You will see a line numbered from 0 to 100. 100 means the best health you can imagine. 0 means the worst health you can imagine.

Please indicate on the line how your health is TODAY using the slider below.
[*VAS scale anchored at 0 "The worst health you can imagine" and 100 "The best health you can imagine"*]

17. A. How often do you have a drink containing alcohol?
[*multiple choice, select one*]

- Never
- Monthly or less
- 2 to 4 times per month
- 2 to 3 times per week
- 4 times or more per week

B. [*asked if any option other than "Never" is selected in A*] How many units of alcohol do you drink on a typical day when you are drinking? Here are some examples of estimated units to help you answer as accurately as possible:

Wine
Small glass (125ml) is 1.5 units
Standard glass (175ml) is 2 units
Large glass (250ml) is 3 units

Lager/beer/cider
Pint of higher strength (e.g., ABV 5.2%) is 3 units
Pint of lower strength (e.g., ABV 3.6%) is 2 units
Can (440ml) is 2.5 units
Bottle (330ml) is 1.5 units

Single shot of spirits (25ml of ABV 40%) is 1 unit
Alcopop (275ml) is 1.5 units
[*multiple choice, select one*]

- 0 to 2
- 3 to 4
- 5 to 6
- 7 to 9
- 10 or more

---

18. A. Do you currently smoke tobacco? This does **not** include vaping.
[*multiple choice, select one*]
    - Yes – I smoke daily
    - Yes – I smoke less than daily
    - No – but I previously smoked daily
    - No – but I previously smoked less than daily
    - No – I have never smoked

    B. [*asked if "Yes – I smoke daily" is selected in A]* How many times do you smoke tobacco per day? For example, if you smoke 10 cigarettes, please write 10.
    [*numerical input*]

    C. [*asked if "Yes – I smoke less than daily" is selected in A]* How many times do you smoke tobacco per week? For example, if you smoke 10 cigarettes, please write 10.
    [*numerical input*]

    D. [*asked if "Yes – I smoke daily" or "Yes – I smoke less than daily" is selected in A]* How long have you smoked tobacco for?
    [*numerical input, years and months*]

    E. [*asked if "No – but I previously smoked daily" is selected in A]* In the past, how many times did you smoke tobacco per day? For example, if you smoke 10 cigarettes, please write 10.
    [*numerical input*]

    F. [*asked if "No – but I previously smoked less than daily" is selected in A]* In the past, how many times did you smoke tobacco per week? For example, if you smoke 10 cigarettes, please write 10.
    [*numerical input*]

    G. [*asked if "No – but I previously smoked daily" or "No – but I previously smoked less than daily" is selected in A]* In the past, how long did you smoke tobacco for?
    [*numerical input, years and months*]

ADDITIONAL DESIGN NOTES:
Question 24A will only be asked at baseline.
Questions 35, 41, and 42 will be asked only at baseline and endpoint.
Questions 20, 24B, and 24C will be asked only at midpoint and endpoint. The Comparator group will not answer 24B.
All other remaining questions will be asked at baseline, midpoint and endpoint.

[Baseline]

The next set of questions will seem familiar. They will ask about **your and your household's circumstances** and how **your household** has accessed food. You previously answered them, thinking about the last 12 months. **This time, you will be thinking about the last 7 or 30 days** - the question will tell you which.

Please answer as accurately as you can, but do not worry if you are not sure. Please answer as accurately as you can, but do not worry if you are not sure. You do not have to answer questions that make you feel uncomfortable.

If you want to know more about why we're asking these questions, please refer to the Participant Information Sheet, or you can find out more at the end of this questionnaire.

[Midpoint and endpoint]

The following questions ask about **you and your household's circumstances** and how **your household** has accessed food. Please answer as accurately as you can, but do not worry if you are not sure. You do not have to answer questions that make you feel uncomfortable.

If you want to know more about why we're asking these questions, please refer to the Participant Information Sheet, or you can find out more at the end of this questionnaire.

19. In the last 7 days, were you doing any of the following? Please **select all** responses that apply to you.

    For example, if you were in full-time employment but have also been on maternity or paternity leave in the last 7 days, select "Working as an employee (30 hours or more per week)" **and** "On maternity or paternity leave".
    [*multiple choice, select all that apply*]
    - Working as an employee (30 hours or more per week)
    - Working as an employee (less than 30 hours per week)
    - Self-employed or freelance (30 hours or more per week)
    - Self-employed or freelance (less than 30 hours per week)
    - Temporarily away from work ill (with pay)
    - Temporarily laid off (without pay)
    - On maternity or paternity leave
    - Doing any other kind of paid work
    - Retired
    - Out of work due to living with a long-term health condition or disability
    - Studying
    - Volunteering
    - Caregiving/Looking after home and/or family
    - Other (please specify) [*allows text response*]
    - None of the above

20. A. Has your household income changed in the last three months?
    [*multiple choice, select one*]
    - No
    - Yes

B. [*asked if "yes" is selected in A*] The next question will ask you about your household's income. How would you like to report this?
[*multiple choice, select one*]

- Monthly
- Weekly

C. [*asked if "monthly" is selected in B*] From the income bands below, about how much money does your household currently receive every month, after any tax deductions and National Insurance? If you don't have additional household members, just answer for yourself.
[*multiple choice, select one*]

- Less than £400
- £401 to £600
- £601 to £800
- £801 to £1000
- £1001 to £1200
- £1201 to £1400
- £1401 to £1600
- £1601 to £1800
- £1801 to £2000
- More than £2000

D. [*asked if "weekly" is selected in B*] From the income bands below, about how much money does your household typically receive every week, after any tax deductions and National Insurance? If you don't have additional household members, just answer for yourself.
[*multiple choice, select one*]

- Less than £100
- £101 to £151
- £151 to £200
- £201 to £250
- £251 to £300
- £301 to £350
- £351 to £400
- £401 to £450
- £451 to £500
- More than £500

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21. A. Please say whether the statement below was often true, sometimes true or never true for you/people in your household in the **last 30 days**. Please **select one** answer only for each statement.
[*multiple choice, select one*]

I/We worried whether my/our food would run out before I/we got money to buy more

- Often true
- Sometimes true
- Never true

The food that I/we bought just didn't last, and I/we didn't have money to get more

- Often true
- Sometimes true
- Never true

I/We couldn't afford to eat balanced meals

- Often true
- Sometimes true
- Never true

B. [*asked if any answer to A is "Often true" or "Sometimes true"*] In the **last 30 days**, did you or any other adult in your household ever cut the size of your meals or skip meals because there wasn't enough money for food?

- Yes
- No

C. [*asked if answer to B is "Yes"*] In the **last 30 days**, how many days did this happen?
[*numerical input*]

D. [*asked if any answer to A is "Often true" or "Sometimes true"*] In the **last 30 days**, did you ever eat less than you felt you should because there wasn't enough money for food?
[*multiple choice, select one*]

- Yes
- No

E. [*asked if any answer to A is "Often true" or "Sometimes true"*] In the **last 30 days**, were you ever hungry but didn't eat because there wasn't enough money for food?
[*multiple choice, select one*]

- Yes
- No

F. [*asked if any answer to A is "Often true" or "Sometimes true"*] In the **last 30 days**, did you lose weight because there wasn't enough money for food?
[*multiple choice, select one*]

- Yes
- No

G. [*asked if answer to B, C, D, E, or F is "Yes"]* In the **last 30 days**, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food?
[*multiple choice, select one*]

- Yes
- No

H. [*asked if answer to G is "Yes"]* In the **last 30 days**, how many days did this happen?
[*numerical input*]

22. A. In the **last 30 days**, have you, or anyone else in your household, **received emergency food support** (e.g., a free parcel of food from a food bank or another emergency food provider)?
[*multiple choice, select one*]

- Yes
- No

B. [*asked "yes" is selected in A*] How often in the **last 30 days** have you, or anyone else in your household, received a free food parcel from a food bank or other emergency food provider?
[*multiple choice, select one*]

- Once
- Twice
- Three times
- Four or more times

23. A. In Liverpool, many community organisations allow people to buy food at a heavily discounted price, or as part of a membership. These are different from food banks in that they do not provide emergency food support. They offer a choice of food, often provide a retail-like environment and may provide social support. Some of these spaces also provide meals for a discounted price or sometimes for free.

These community spaces have many different names, including:

- Food or community hubs
- Food or community pantries
- Food clubs or unions
- Community shops/stores/groceries
- Community fridges
- Community markets
- Community kitchens or cafes
- Community gardens

In the **last 30 days**, have you, or anyone else in your household, **eaten, bought or received food** from one (or more) of the **community spaces** listed above?
[*multiple choice, select one*]

- Yes
- No

B. [*asked "yes" is selected in A*] **How often** in the **last 30 days** have you, or anyone else in your household, **eaten, bought or received food** from a **community space** like those listed?
[*multiple choice, select one*]

- Every day
- Most days
- 2-3 times a week
- About once a week
- 2-3 times a month
- About once a month

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24. A. The Queen of Greens is a mobile greengrocer that sells fruit and vegetables in different neighbourhoods across Liverpool.

    Have you ever visited or bought food from the Queen of Greens? Please select all the statements that apply to you.
    [*multiple choice, select all that apply*]

    - I have never shopped at the Queen of Greens
    - I regularly shop at the Queen of Greens
    - I used to shop at the Queen of Greens regularly, but I don't anymore
    - I have shopped at the Queen of Greens in the last few months
    - I have shopped at the Queen of Greens before, but it was more than a few months ago
    - The Queen of Greens used to stop near where I live

    B. In the last 3 months, how often have you or someone in your household visited and bought food from the Queen of Greens bus **in your area** (by this, we mean a stop that is within 1km of where you live)?
    [*multiple choice, select one*]

    - Never
    - Once
    - Twice
    - Once a month
    - Twice a month
    - Three times a month
    - Once a week
    - More than once a week

C. In the last 3 months, how often have you or someone in your household visited and bought food from the Queen of Greens bus **in a different area** (by this, we mean a stop that is more than 1km from where you live)?
[*multiple choice, select one*]

- Never
- Once
- Twice
- Once a month
- Twice a month
- Three times a month
- Once a week
- More than once a week

The next set of questions will ask you about **how you travel to get your food and the factors that influence where you go** to get it.

25. When you go food shopping, how do you travel there? Please select **all** that apply.
[*multiple choice, select all that apply*]
    - Walk
    - Cycle
    - By mobility scooter
    - By public transport
    - By taxi
    - Someone takes me there and brings me back in their vehicle
    - Drive my own vehicle
    - Drive someone else's vehicle
    - I get my food shopping delivered
    - Other (please specify) [*allows text response*]

26. Other than a lack of money, do any of the following make it difficult for you/your household to access or prepare the food you need? Please **select** all that apply.
[*multiple choice, select all that apply*]
    - Too far a distance and/or inadequate transport to food shops
    - Prices of fuel/transport to get to shops are too expensive
    - Lack of selection of foods in food shops
    - A mental or physical health condition or disability
    - Following a restricted diet due to food allergies/sensitivities/intolerances or other health-related reasons
    - Following a particular diet for religious, cultural, sustainability or personal reasons (e.g. Halal diet, Kosher diet, vegan diet)
    - Not having family/friends nearby to share food/meals/groceries with
    - Not having family/friends nearby to travel with to do food shopping
    - Shift working or working multiple jobs
    - Cost of energy to prepare/store food
    - Lack of cupboard space/fridge/freezer for storage of food where you live
    - Lack of working kitchen appliances to cook/prepare food where you live
    - Lack of kitchen tools (e.g. knives, pots, chopping board) to cook/prepare food where you live
    - Other (Please specify) [*allows text response*]
    - None of the above

The next set of questions will ask you about **fruits and vegetables and your opinions about them**.

27. How many **portions of fruit** (fresh or frozen) do **you** eat on a **typical day**? A portion fits in the palm of your hand. For example, a portion could be 1 x handful of grapes OR 1 x medium-sized orange.
[*multiple choice, select one*]
    - 0
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6+

28. How many **portions of vegetables** (fresh or frozen, and not including potatoes, yam, or plantain) do **you** eat on a **typical day**? A portion fits in the palm of your hand. For example, a portion could be 1 x cup of raw, leafy vegetables OR half a cup of carrots.
[*multiple choice, select one*]
    - 0
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6+

29. A. [*shown if participant reports having a child*] How many **portions of fruit** (fresh, tinned or frozen) does your **eldest child** (under 18 years old) eat on a typical day?

    A child's portion fits into the palm of their hand. If your eldest child is not yet eating solid foods, please select "Child not eating solids".
    [*multiple choice, select one*]
    - 0
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6
    - 7
    - 8
    - 9
    - 10+
    - Child not eating solids

B. [*shown if participant reports having a child AND they did not answer "Child not eating solids" in A*] How many **portions of vegetables** (fresh, tinned or frozen) does your **eldest child** (under 18 years old) eat on a typical day?

A child's portion fits into the palm of their hand. If your eldest child is not yet eating solid foods, please select "Child not eating solids".

[*multiple choice, select one*]

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10+
- Child not eating solids

30. How **confident** are you that you can **afford to buy t**he **fruits and vegetables** that your household needs for **a healthy diet**?

[*multiple choice, select one*]

- Very confident
- Somewhat confident
- Neutral
- Somewhat unconfident
- Very unconfident

31. Approximately how much does your **household spend on fresh fruit and vegetables per week**? Please **do not** include spending from Healthy Start, Alexandra Rose or other fruit and vegetable voucher or payment programmes.

[*multiple choice, select one*]

- Nothing
- £0.01-£5.00
- £5.01-£10.00
- £10.01-£15.00
- More than £15.00

32. How much do you **like eating fresh fruits**?

You will see a line numbered from 0 to 100 below. 100 means that you extremely like eating fresh fruits. 0 means that you extremely dislike eating fresh fruits. Please move the slider to answer.

[*VAS scale anchored at 0 "Extremely dislike" and 100 "Extremely like"*]

33. How much do you **like eating fresh vegetables**? This includes fresh vegetables that have been prepared and cooked where appropriate.

You will see a line numbered from 0 to 100 below. 100 means that you extremely like eating fresh vegetables. 0 means that you extremely dislike eating fresh vegetables. Please move the slider to answer.

[*VAS scale anchored at 0 "Extremely dislike" and 100 "Extremely like"*]

34. Please select **how much you agree** with the following statements about fresh fruit and vegetables:

	Not at all	A little	A lot
A. They are expensive	○	○	○
B. They spoil before I get a chance to eat them	○	○	○
C. They take too long to cook/prepare	○	○	○
D. I don't know how to cook/prepare them	○	○	○
E. I don't know how to choose fresh fruit and vegetables	○	○	○
F. I'm still hungry after I eat them	○	○	○
G. I don't think about them when I'm hungry	○	○	○
H. My family doesn't like them	○	○	○
I. My budget does not allow me to buy them	○	○	○

The following questions will ask how you feel about your wellbeing and your neighbourhood, and how supported you feel **by others**. You do not have to answer questions that make you feel uncomfortable.

If you want to know more about why we're asking this, please refer to the Participant Information Sheet, or you can find out more at the end of this questionnaire.

35. Overall, how satisfied are you with your life nowadays?
[*VAS scale anchored at 0 "Not at all satisfied" and 10 "Completely satisfied"*]

36. Please read each statement and select a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

- 0 - Did not apply to me at all
- 1 - Applied to me to some degree, or some of the time
- 2 - Applied to me to a considerable degree or a good part of the time
- 3 - Applied to me very much or most of the time

[*multiple choice, select one for each statement*]

A. I found it hard to wind down
B. I was aware of dryness of my mouth
C. I couldn't seem to experience any positive feeling at all
D. I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)
E. I found it difficult to work up the initiative to do things
F. I tended to over-react to situations

G. I experienced trembling (e.g. in the hands)
H. I felt that I was using a lot of nervous energy
I. I was worried about situations in which I might panic and make a fool of myself
J. I felt that I had nothing to look forward to
K. I found myself getting agitated
L. I found it difficult to relax
M. I felt down-hearted and blue
N. I was intolerant of anything that kept me from getting on with what I was doing
O. I felt I was close to panic
P. I was unable to become enthusiastic about anything
Q. I felt I wasn't worth much as a person
R. I felt that I was rather touchy
S. I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)
T. I felt scared without any good reason
U. I felt that life was meaningless

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37. A. How often do you feel lonely?
[*multiple choice, select one*]
- Often/always
- Some of the time
- Occasionally
- Hardly ever
- Never

B. How often do you feel that you lack companionship?
[*multiple choice, select one*]
- Often/always
- Some of the time
- Occasionally
- Hardly ever
- Never

C. How often do you feel left out?
[*multiple choice, select one*]
- Often/always
- Some of the time
- Occasionally
- Hardly ever
- Never

D. How often do you feel isolated from others?
[*multiple choice, select one*]
- Often/always
- Some of the time
- Occasionally
- Hardly ever
- Never

38. Below is a set of statements about your neighbourhood. Please indicate the extent to which you agree or disagree with these statements by selecting an option.

	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
A. I can get what I need in this neighbourhood.	○	○	○	○	○
B. This neighbourhood helps me fulfil my needs.	○	○	○	○	○
C. I feel like a member of this neighbourhood.	○	○	○	○	○
D. I belong in this neighbourhood.	○	○	○	○	○
E. I have a say about what goes on in my neighbourhood.	○	○	○	○	○
F. People in this neighbourhood are good at influencing each other.	○	○	○	○	○
G. I feel connected to this neighbourhood.	○	○	○	○	○
H. I have a good bond with others in this neighbourhood.	○	○	○	○	○

39. A. How many people are so close to you that you can count on them if you have great personal problems?
[*multiple choice, select one*]

- None
- 1-2
- 3-5
- 5+

B. How much interest and concern do people show in what you do?
[*multiple choice, select one*]

- None
- Little
- Uncertain
- Some
- A lot

C. How easy is it to get practical help from neighbours if you should need it?
[*multiple choice, select one*]

- Very difficult
- Difficult
- Possible
- Easy
- Very easy

The next three questions ask about **your opinions on your housing association**. You may have answered similar questions before, outside this research.

We want to remind you that **your housing association will not know how you respond to these questions** or any of the questions in this questionnaire.

40. A. Taking everything into account, how satisfied or dissatisfied are you with the service provided by your housing association?
[*multiple choice, select one*]
    - Very satisfied
    - Fairly satisfied
    - Neither satisfied nor dissatisfied
    - Fairly dissatisfied
    - Very dissatisfied
    - Don't know

    B. How satisfied or dissatisfied are you that your housing association listens to your views and acts upon them?
    [*multiple choice, select one*]
    - Very satisfied
    - Fairly satisfied
    - Neither satisfied nor dissatisfied
    - Fairly dissatisfied
    - Very dissatisfied
    - Don't know

    C. How satisfied or dissatisfied are you that your housing association makes a positive contribution to your neighbourhood?
    [*multiple choice, select one*]
    - Very satisfied
    - Fairly satisfied
    - Neither satisfied nor dissatisfied
    - Fairly dissatisfied
    - Very dissatisfied
    - Don't know

The next set of questions will ask you about any **health or support services you may have used in the past six months.**

41. A. In the **past six months**, have **you** had an appointment with (in-person/online/on the phone) or been seen by any of the services or professions listed below? Please **select all** that apply.

    Note. Do **not** include appointments or visits that were for someone else, for example, others in your household, your children, or someone you care for.
    [*multiple choice, select all that apply*]
    - GP
    - Practice nurse (at GP surgery)
    - Community/District nurse
    - Specialist nurse (e.g. a respiratory nurse)
    - Dentist
    - Physiotherapist
    - Occupational therapist

- Social worker or care manager
- Dietician
- Community psychiatric nurse/Community mental health nurse
- Psychiatrist
- Psychologist / Cognitive Behavioural Therapist / Other Mental Health Worker
- Paramedic /Ambulance call out
- A screening service (e.g., cervical, breast, bowel cancer, Abdominal Aortic Aneurysm (AAA))
- Other (please specify) [*allows text response*]
- None of the above

B. In the **past six months**, have you attended any of the places listed below? Please **select all** that apply.

Note. Do **not** include appointments or visits that were for someone else, for example, others in your household, your children, or someone you care for.
[*multiple choice, select all that apply*]

- A&E department
- Hospital (as an in-patient for more than one day)
- Hospital (as a day patient with no overnight stay)
- Hospital (as an outpatient)
- None of the above

C. [*asked if "Hospital (as an in-patient for more than one day" selected in B*] In the **past six months**, how many days were you an in-patient in a hospital?
[*numerical input*]

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42. In the **past six months**, have you or has anyone in your household contacted/used any of the services listed below for information or support related to help with rising costs of living? Please **select all** that apply.
[*multiple choice, select all that apply*]
    - Citizens Advice
    - Age UK
    - Debtline
    - Step Change
    - CAP UK
    - Turn2Us
    - Liverpool Citizen Support
    - Benefit Maximisation Team
    - Your housing association
    - Your local council
    - Other (please specify) [*allows text response*]
    - None of the above - I/we haven't sought cost of living information or support.

>> Would you like to know more about why we're asking the questions we've asked in this questionnaire?
[*multiple choice, select one*]

- **Yes** [*takes participant to an information page titled "Why we're asking these questions" – see below*]
- **No** [*takes participant to end of questionnaire debrief*]

[*If selected yes above*]

Why we're asking these questions

We are only asking these questions for research purposes.

We are asking about your background, your living situation, your household and its income to understand **how similar people taking part in the study** are to the general population.

We would also like to know this information so that we can investigate **how well the activities delivered as part of this study work for people with a variety of characteristics** (including age, gender, ethnicity, height and weight, health status, eating patterns, use of community services, opinions on their housing provider, and household characteristics).

If your area starts receiving fruit and vegetable vouchers as part of the study, we will also use the information you provide about your household to work out **how many vouchers to send you**.

We will use information from your online food diaries and your answers to questions about your experiences and feelings about getting food, your mental wellbeing, and your community to investigate **how the activities delivered as part of this study affect these parts of people's lives**.

All the data we collect will be anonymised and then additionally used to **explore how well the study's activities might work to improve health if they were scaled up across the whole of Liverpool and throughout England**. To do this "modelling" analysis, we need detailed information about everyone taking part, including age, gender, ethnicity, height, weight, daily activities, health status, education, alcohol and tobacco use, use of health services, and household characteristics. These factors can influence future health, so we need to account for them when we consider how effective our study's activities might be at improving health for the whole population if they were rolled out in the future.

Thank you for taking the time to complete this questionnaire. After you complete your food questionnaires over the next few days, the research team will contact you to send your vouchers.

Your responses have been saved. When you are ready, please **click the button below to end the questionnaire and submit your responses** so the researchers can confirm you have finished.

Some of the questions in the questionnaire asked you about having enough food to eat and about experiencing low mood.

If you are struggling to get enough food to eat, we encourage you to seek help. Your housing officer can help signpost you to available support in your community, and your GP and associated services (like social prescribers) can also help.

If you are experiencing low mood, please contact your GP as soon as possible.

We have also provided links and contact details to other organisations that may be helpful to you below.

For support with food and other essentials:

- **Feeding Liverpool** – A map of community food spaces offering affordable food and tackling food waste across Liverpool is available at: https://www.feedingliverpool.org/community-food-spaces/map/. Information and contact details of emergency food providers within the city can be found at: https://www.feedingliverpool.org/crisis-support/.
- **Liverpool Citizens Support Scheme** – If you are in crisis, you may be able to apply for support for food, fuel, furniture and household essentials by calling Freephone 0800 456 1523 or 0151 233 3053 (Monday to Friday 8am – 6pm).

If you are having a difficult time or struggling to cope mentally:

- **Samaritans** – you can call 116 123 (24 hours a day, 365 days a year) totally free of charge. You can also access practical advice and information at this link: https://www.samaritans.org/how-we-can-help/if-youre-having-difficult-time/signs-you-may-be-struggling-cope/.
- **Campaign Against Living Miserably (CALM)** – you can call 0800 58 58 58 (every day 5pm – midnight). Practical advice and further information are also available at this link: https://www.thecalmzone.net/.

- **Mind** – you can call Mind's support line on 0300 102 1234 (Monday to Friday 9am – 6pm)to speak to a trained advisor and find specialist support if you need it. Several other useful options for accessing support are provided at: https://www.mind.org.uk/information-support/guides-to-support-and-services/seeking-help-for-a-mental-health-problem/mental-health-helplines/.

If you have any specific issues or concerns related to your housing or the services and support provided by your housing association, please contact your housing officer in the first instance (if applicable) or your housing association. You can find the contact details for Onward, Riverside and Torus below.

- **Onward** – you can call 0300 555 0600 (Mondays, Tuesdays, Thursdays, Fridays 8am – 6pm; Wednesdays 10am – 6pm). All ways to contact Onward, including details on how to reach them outside these hours, are available at: https://www.onward.co.uk/contact-us/.
- **Riverside** – you can call 0345 111 0000 at any time on any day. All ways to contact Riverside are available at: https://www.riverside.org.uk/contact_us/.
- **Torus** – you can call 0800 678 1894 (Monday to Friday 8am – 8pm; Saturdays 8 am – noon). All ways to contact Torus, including details on how to reach them outside these hours, are available at: https://www.torus.co.uk/contact-us.

If you need general advice about benefits, debt, money, housing and employment:

- **Raise** – if you are struggling with bills, benefits or debt, you can speak to an expert advisor by calling 0151 459 1556 (Monday to Thursday 9:30am – 3:30pm; Fridays 9:30am – 12:30pm). For debt advice, you can also request a face-to-face appointment at https://www.raiseadvice.org.uk/debt-advice or visit the drop-in on Fridays (10am – 1pm) at Rotunda (L5 2PL). For benefits advice, you can request a face-to-face appointment at https://www.raiseadvice.org.uk/benefits-advice.
- **Liverpool City Council** – you can find local advice and support on benefits at the Liverpool City Council website: https://liverpool.gov.uk/benefits/.
- **Citizens' Advice Bureau** – you can contact an advisor using the national phone service on 0800 114 8848 (Monday to Friday 9am – 5pm, and you will be connected to a local Citizens' Advice Bureau branch. You can also access the online chat service, which is tailored to your specific problem, by following this link: https://www.citizensadvice.org.uk/about-us/contact-us/.
- **National Debtline** – for debt advice, including budgeting, understanding your options and dealing with creditors, you can access expert guidance by calling 0808 808 4000 (Monday to Friday 9am – 8pm; Saturdays 9:30am – 1pm). Practical advice and further information are also available at: https://nationaldebtline.org/.
