

Standard Evaluation Framework

for dietary interventions

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Observatory

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NOO was established to provide a single point of contact for wide-ranging authoritative information on data, evaluation and evidence related to obesity, overweight, underweight and their determinants. The Observatory works with a range of organisations and supports policy makers and practitioners involved in obesity and related issues.

Front cover illustration by Michael Heasman

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1. Introduction

National Obesity Observatory resources on evaluation

The National Obesity Observatory (NOO) is committed to improving the quality and quantity of evaluations of interventions related to obesity, overweight, underweight and their determinants. In order to do this, NOO has produced a number of resources that provide information and support to practitioners with an interest in evaluation:

- the *'Standard Evaluation Framework (SEF) for weight management interventions'*¹
- the *'Standard Evaluation Framework (SEF) for diet interventions'* (this document)²
- the *'Standard Evaluation Framework (SEF) for physical activity interventions'*³
- a Collection of Resources on Evaluation (CoRE) which provides additional guidance and case studies⁴
- an evaluation data collection tool⁵
- a searchable database of interventions⁶
- guidance on *'Measuring diet and physical activity in weight management interventions'*^{7,8}

Figure 1 (on page 5) is a flow chart to guide readers to the most relevant resources to assist with evaluations.

Introduction to this document

This document builds on the *'Standard Evaluation Framework (SEF) for weight management interventions'*,¹ published by NOO in April 2009.¹ It takes the principles described in the original SEF and applies them to dietary interventions. It contains a list of 'essential' and 'desirable' criteria for data required for a comprehensive and robust evaluation. Essential criteria are the minimum data and information recommended to perform a basic evaluation of an intervention that sets out to improve diet. Desirable criteria are additional data that would improve the quality of an evaluation, and enhance understanding about what has been achieved, and the processes that have taken place during the intervention.

A glossary of terms is available on page 35.

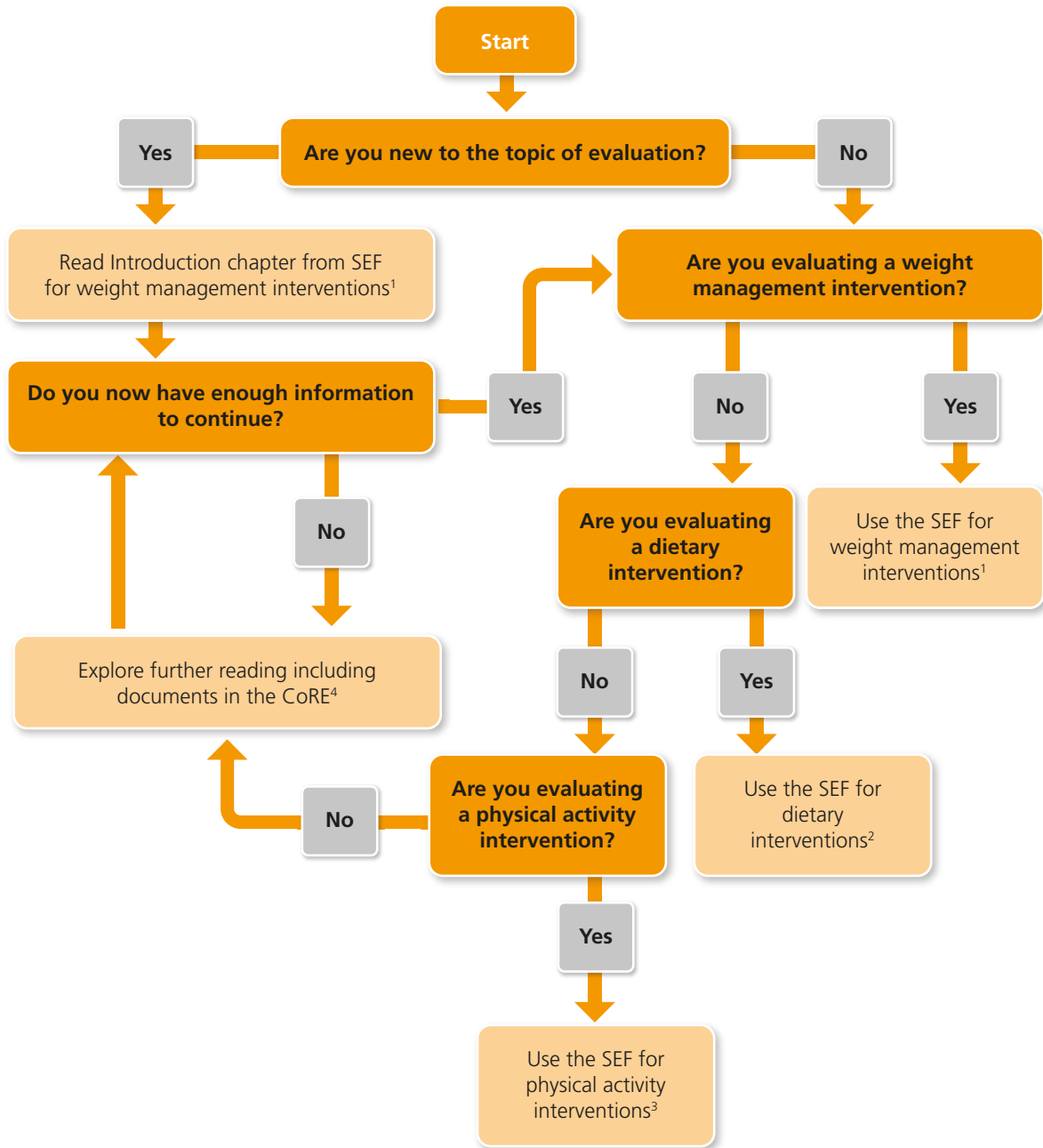
What does this document aim to do?

The SEF for dietary interventions aims to describe and explain the information that should be collected in any evaluation of an intervention that aims to improve dietary intake or associated behaviour. It is aimed at interventions that work at individual or group level, not at population level. It provides detailed specific guidance on the following areas:

1. How to identify appropriate dietary outcomes for evaluating different types of intervention.
2. How to define suitable measures for different types of dietary outcome.
3. How to approach the challenges of assessing and measuring dietary intake and diet-related behaviour.

An accompanying SEF is available with a specific focus on physical activity.³

Figure 1: Flow chart to show which NOO evaluation resource to use



What does this document not aim to do?

- Provide guidance that is intended to support the evaluation of medical interventions, such as surgery or medications.
- Provide guidance on the evaluation of broader community-level programmes, or interventions that promote diet improvement through changes to the environment. These types of programmes present additional evaluation challenges that are beyond the scope of this document.
- Provide an introduction to the concepts of evaluation; such an introduction is contained in Chapter 1 of the *SEF for weight management interventions*.¹

Target audiences

The target audiences for this document are:

- commissioners or managers of weight management interventions with a dietary component
- commissioners or managers of dietary interventions
- obesity and diet leads in local authorities
- practitioners running weight management interventions with a dietary component
- evaluators of dietary interventions or weight management interventions with a dietary element.

Why do we need a SEF for dietary interventions?

There are many public health interventions that have a dietary behaviour change element. However, few of these interventions are evaluated.⁹ Additionally, there is a need for more rigorous evaluation of local interventions, particularly those relating to overweight and obesity.¹⁰

Evaluations of public health interventions are often poorly designed, use inappropriate measures, do not report on health outcomes, and tend to focus disproportionately on process measures such as attendance and participant satisfaction.¹⁰ Such evaluation practice makes it hard to compare the impacts of interventions. The wide variety of dietary interventions also presents challenges for evaluation. A cooking education programme for example, is likely to require the assessment of different health outcomes and use different data collection methods than a 'five-a-day' promotion or free fruit and vegetable schemes.

This document aims to help address these issues by providing a framework to guide the design and implementation of evaluations of interventions with dietary outcomes.

2. Principles of evaluation

Evaluation is about judging the value of an activity and assessing whether or not it has achieved what it set out to do. In public health and health promotion, an evaluation determines the extent to which a programme has achieved its objectives, and will assess how different processes have contributed to this.¹¹ Evaluation is a critical aspect of good project management and should be a component of interventions of any size.

The *SEF for weight management interventions*¹ contains an introduction to evaluation principles and methods.¹

When designing an evaluation, the single most important principle is to ensure that the evaluation focuses on the objectives of the programme.

The two basic evaluation questions:

1. What are the objectives of your project?
2. Will the evaluation measure whether these objectives have been achieved?

The objectives determine the outcome of the intervention and what should be measured – known as ‘outcome measures’ or ‘indicators’.

The main focus of an evaluation should be to assess whether the primary outcomes that the project is trying to achieve have been met. Secondary outcomes are things that are of interest, and may add to the knowledge generated by the evaluation. It may be of particular interest to collect secondary outcome data relating to the mechanisms by which the intervention is expected to work – this is illustrated in the following scenarios.

Scenario 1

A community nutrition outreach project has the objective of increasing the proportion of children who eat an average of five portions of fruit and vegetables per day. It should therefore measure change in the proportion of children who eat five portions of fruit and vegetables as the primary outcome measure, irrespective of other aspects of diet such as total energy or fat intake. However, total energy intake may be a valuable secondary outcome measure.

If the project had focused on achieving its objectives by increasing the children’s experience and knowledge of different types of fruit and vegetables, then this might also be measured as a secondary outcome.

Scenario 2

A ‘Cook and Eat’ project has an objective of increasing the number of parents in a community who prepare meals for their family using unprocessed ingredients at home twice a week or more. The primary outcome measure should therefore be change in the proportion of parents who have prepared meals from unprocessed ingredients at home at least twice a week. Other measures such as total energy intake or satisfaction with the programme would be interesting, but not essential to the evaluation. These would be secondary outcome measures or indicators.

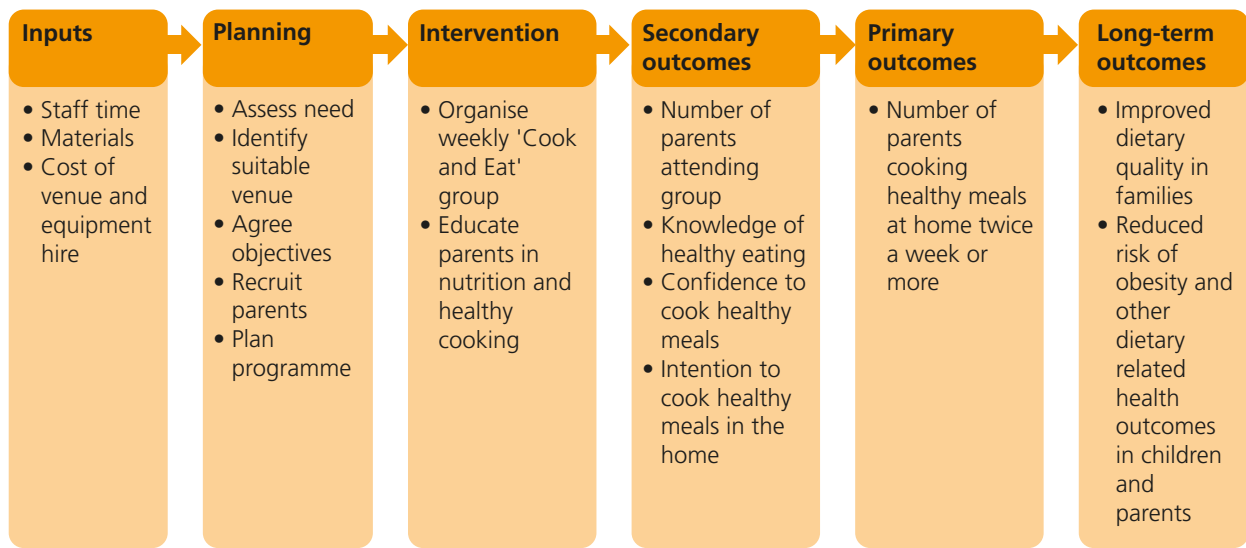
It is important to be clear about whether dietary intake is the primary or secondary outcome of interest. This differentiation is particularly important when evaluating a weight management intervention with a dietary component. For example, an intervention may have the objective of decreasing consumption of takeaway meals and processed foods. Therefore, change in consumption of takeaways and processed foods would be the primary outcome and any other changes (such as body weight or self-esteem) would be secondary outcomes. Another programme may have the objective of reducing the participants’ weight

as a result of decreasing consumption of takeaways and processed foods; in this instance weight reduction is the primary outcome and consumption of takeaways and processed foods is the secondary outcome.

A logic model can help to identify primary and secondary outcome indicators. Logic models describe the relationship between each element in a project or intervention and the anticipated direction of change. They can be useful in describing and explaining what is expected to happen in a project, providing a mechanism to check that the appropriate indicators have been selected and the project is likely to achieve its objectives.

Figure 2 provides an example of a logic model for a 'Cook and Eat' project.

Figure 2: Example logic model for a 'Cook and Eat' project, showing stages of evaluation (adapted from US Physical Activity Evaluation Handbook¹²)



3. Diet: selecting and measuring outcomes

Selecting dietary outcomes

An outcome indicator should be selected on the basis of how well it measures the objectives of the intervention. However, there are other factors that are important in choosing an indicator:

- selected outcome(s)
- level of data required (individual, group or population)
- characteristics of the individuals, group or population
- timeframe of interest
- available time and resources (including expertise).

If change in dietary intake is the primary outcome, there are several types of outcome which may be the focus of the intervention. There are four main categories of outcome:

- intake of a particular food or food group (frequency or amount of consumption over a period of time)
- intake of a particular nutrient (frequency or amount of consumption over a period of time)
- overall energy intake (total average calories consumed over a period of time)
- meeting of dietary recommendations (over a period of time).

Intervention objectives and outcomes should be agreed early in the development of a project along with the proposed evaluation design. When considering outcomes, it is important to think about the purpose of the evaluation, how the results will be used, and what decisions might be made as a result.

In addition, outcomes must be measurable. Therefore, the practicalities of collecting the required outcome data, and the choice of instrument used to measure change should be considered at the project design stage. Measurement of diet can be challenging; more detail is provided in the NOO reviews of measurement of diet and physical activity.^{7,8} The following section presents the main options for measuring diet in evaluations.

Options for measuring dietary intake

Option 1: intake of a specific food/food group

If an intervention focuses on increasing or decreasing consumption of a specific food, such as fruit or vegetables, then this should be the main outcome measure. It is not always necessary to measure secondary outcomes, such as total energy intake, although such information may add to understanding the impact of the intervention.

Table 1 gives an example of an intervention where change in intake of a food is the primary outcome measure.

Table 1: Example of outcome measure of food/food group intake

Objective	Intervention	Example of outcome measure
Increase daily number of portions of fruit and vegetables consumed by individuals in a particular community.	Recipe cards for meals with fresh fruit and vegetables provided at local leisure centres, community centres and GP surgeries.	Mean number of portions of fruit and vegetables consumed daily by sample of community (pre- and post-intervention).

In the example above, the dietary intake data collected relate to the primary outcome of interest. Secondary outcome data, such as total energy intake, would add information to the evaluation but are not essential.

If an intervention relies on measurement of one aspect of diet, it is important to understand that this measure does not represent total dietary intake. For example, increasing fruit and vegetable consumption is not necessarily a predictor of positive changes in diet overall. Indeed, it may be that by reducing or increasing the intake of a particular food, there are unintended impacts on other aspects of an individual's diet. Restricting measurement to one type of food may therefore limit the extent to which conclusions can be made about the impact of an intervention on total dietary intake and related health outcomes.

Option 2: intake of a specific nutrient

If the objective of an intervention is to change the intake of a particular nutrient, then this should be the primary outcome measure. Table 2 gives an example of an intervention where the objective is to change the intake of a nutrient, and an appropriate primary outcome.

Table 2: Example of outcome measure of nutrient intake

Objective	Intervention	Example of outcome measure
Decrease the consumption of fat in a particular community.	Weekly classes for ten weeks to educate participants in how to cook low fat meals and modify cooking practices to use lower-fat cooking techniques.	Reduction in mean daily fat intake.

Option 3: total energy intake

Total energy intake may be an appropriate outcome measure when evaluating an intervention, particularly if maintaining or achieving a healthy weight is a primary or secondary outcome. In such an intervention, it is helpful to be able to 'track' individuals – taking and recording measures from the same people at baseline and follow-up – so that individual level changes in mean energy intake can be calculated.

Whilst total energy intake may be the most appropriate measure for some interventions, it is important to note that there are significant challenges and resource implications associated with the measurement of total energy intake. Further information about this issue can be found in the NOO paper, *'Measuring diet and physical activity in weight management interventions'*.⁷

Option 4: proportion meeting recommended levels

For some nutrients, there are guideline levels of intake that are appropriate for the majority of the population. Guidelines are provided by the government on consumption of particular food groups such as fruit and vegetables and starchy foods.¹³ Population based Dietary Reference Values (DRVs) are set for a range of nutrients,¹⁴ including percentages of daily energy intake; vitamins and minerals; total fat; fatty

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acids; starch; sugars and fibre. Some interventions will take account of these guidelines and may focus on trying to help people reach a particular threshold e.g. to eat five portions of a variety of fruit and vegetables per day, or to ensure that no more than 11% of their food energy is derived from saturated fat (in line with the DRV).

If the objective of an intervention is to increase the proportion of people achieving a particular recommended dietary goal, this would require a different type of outcome measure from those described previously, even if the intervention is similar. An example is shown in the table below.

Table 3: Example of outcome measure of proportion of participants achieving a recommended dietary goal

Objective	Intervention	Example of outcome measure
To increase the proportion of individuals consuming the recommended five portions of fruit and vegetables per day.	Weekly cooking clubs teaching the preparation of fruit and vegetable-based meals.	% increase in the proportion of participants eating five portions of fruit and vegetables per day at follow-up.

It is important to note that if different samples are used for baseline and follow-up, it is more difficult to assume that any changes were due to the intervention. For example, in Table 3 above, we may observe an increase from baseline to follow-up in the proportion of participants eating five portions of fruit and vegetables per day. However, we do not know that this increase is a result of the intervention – there may be other factors confounding the outcome. Also, the overall mean increase in fruit and vegetable consumption may mask other changes: some people may be eating more, others less. If we are able to follow up individuals we would have a clearer understanding of who had changed and who had not.

Measuring outcomes

Measurement of dietary intake is complex and presents significant challenges. In an academic research setting, an investigator may be able to:

- gather data on individual food intake from detailed questionnaires or from direct observation;
- use objective measures such as clinical indicators^a or biomarkers^b for some foods and nutrients;
- estimate total energy intake from doubly labelled water.^{c,15}

Such methods are more likely to provide reliable assessments of dietary intake than, for example, a basic self-completion questionnaire. However such measurement methods are unlikely to be feasible for a public health intervention in free-living adults, without additional resources and assistance from academics or others experienced in using objective measures and analysing and interpreting the data.

In a public health context, self-report methods are commonly used to collect data on dietary intake. Examples of self-report tools include food frequency questionnaires, 24-hour recall methods, weighed and un-weighed diet records and diet histories. Some data collection questionnaires may include elements of more than one method. Data can be collected retrospectively (for example, recording what was eaten that day) or recorded at the time of consumption. Data are often collected to give an indication of habitual intake (such as through a food frequency questionnaire). They can also be used to provide a snapshot of an individual’s diet during a particular time period.

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 a A number of diet-related conditions and nutritional deficiencies can be identified from the physical appearance of the body when clinically examined.
 b Biomarkers are biochemical indicators that can be assessed in blood, bodily fluids, body tissues or excreta and provide an indication of a limited number and range of nutrient levels.
 c Doubly labelled water provides an accurate, objective measure of energy expenditure.

Table 4 summarises appropriate uses, pros and cons of the self-report dietary assessment methods that are most commonly used in public health. The table is adapted from the Medical Research Council (MRC) toolkit on dietary assessment which provides more detail on this topic and links to existing data collection tools.¹⁶

Table 4: Dietary assessment methods (adapted from MRC Diet and Physical Activity Measurement Toolkit¹⁶)

Dietary assessment method	Suitable usage	Pros	Cons
Weighed food diary	<p>Suitable for collection of detailed dietary data at individual level.</p> <p>Suitable for small intervention studies.</p> <p>Measure of current intake, therefore cannot be used in studies looking at associations of past diet with health outcomes.</p> <p>Can provide accurate estimates for energy, nutrients, foods and food groups.</p>	<p>Considered the ‘gold-standard’ method.</p> <p>Does not rely on memory and recall as recorded at point of consumption.</p> <p>Provides exact portion sizes.</p> <p>Detailed descriptions of foods.</p> <p>All eating occasions are recorded.</p> <p>Captures foods eaten regularly.</p>	<p>Time consuming and labour intensive for both participants and researchers.</p> <p>Costly.</p> <p>Dietary data input and translation into nutrient data is complex.</p> <p>Imposes biggest burden on participants – individuals must be motivated and compliant.</p> <p>Respondent must be numerate and literate.</p> <p>Respondent may alter his/her diet to make it easier to record.</p> <p>Weighing food eaten away from home can be difficult.</p> <p>Several days of recording are necessary because of daily variations in most people’s diet – may be less accurate towards end of recording time.</p> <p>Foods eaten less than once or twice a week may not be captured.</p>

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Dietary assessment method	Suitable usage	Pros	Cons
Estimated food diary	<p>Suitable for detailed dietary data at individual level.</p> <p>Has been used for large-scale prospective studies.</p> <p>Can provide good estimates of energy and most nutrients, foods and food groups.</p>	<p>Records food consumed on all eating occasions, no reliance on memory.</p> <p>Portion size often well described so estimates are usually accurate.</p> <p>Surrogates can be used for those not able to complete a written record, e.g. parents/carers can complete the record for young children, and carers/ adult children for the elderly.</p> <p>Meals can be photographed to aid interpretation of portion size and details of food items consumed.</p> <p>Food consumption can be recorded away from home relatively easily.</p> <p>Captures foods eaten on a regular basis.</p>	<p>Time consuming and costly to turn the diaries into nutrient data.</p> <p>Respondent must be literate.</p> <p>Large respondent burden, although less than the weighed method.</p> <p>Respondent may alter his/ her diet to make it easier to record, or to cover up poor eating habits.</p> <p>Portion sizes of some foods may be difficult to estimate if the description given is inadequate.</p> <p>Foods eaten less than once a week may not be recorded.</p> <p>Several days of recording are necessary because of daily variations in food consumption.</p> <p>For children, foods eaten when not in the presence of parents may be missed or recorded less accurately.</p>
Recalls	<p>Suitable to measure current diet at a group level.</p> <p>Repeated recalls are required to capture daily variation in diet at an individual level.</p> <p>Suitable for nutritional surveys, intervention studies and prospective cohort studies.</p>	<p>Respondent burden is relatively low.</p> <p>Procedure unlikely to alter food intake patterns.</p> <p>Responded literacy not required.</p> <p>Interview relatively quick (e.g. 20–30 minutes).</p> <p>Web-based applications can be used.</p>	<p>Single 24-hour recall not representative of habitual intake but may be useful for group averages.</p> <p>Dependent on respondent's ability to recall intake accurately.</p> <p>Possibility of recall bias.</p> <p>Expensive to administer due to high interviewer burden but telephone 24-hour recalls can reduce cost.</p> <p>Repeat 24-hour recalls increase time and cost of analysis.</p>

Dietary assessment method	Suitable usage	Pros	Cons
Food Frequency Questionnaire (FFQ)	<p>One of the most commonly used retrospective methods.</p> <p>Used in a wide range of dietary studies including cross-sectional surveys, case-control studies and cohort studies.</p> <p>May be a particularly useful method to measure specific dietary behaviours and the intake of particular food groups (e.g. fruit and vegetables) or selected micronutrients which occur in a limited number of foods (e.g. calcium).</p>	<p>Low respondent burden.</p> <p>Assesses habitual consumption over period of time.</p> <p>Comparatively easy to administer.</p> <p>Can be low cost compared to other dietary assessment methods.</p> <p>May be self-administered via mail or internet.</p> <p>Can be used to gather information on a range of foods, or designed to be shorter and focus on foods rich in a specific nutrient or a particular group of foods e.g. fruit and vegetables.</p> <p>Portion size estimates can be used to obtain absolute nutrient intakes.</p> <p>An open section allows recording of foods consumed not included on the food list, cooking methods, seasonal consumption etc.</p> <p>Standardisation of responses enables swift analyses.</p> <p>Computer-readable forms can be scanned reducing data-entry errors.</p> <p>Existing FFQs can be modified for use in new studies if the analysis package is available.</p>	<p>Accurate reporting relies on respondent memory.</p> <p>Possible respondent bias.</p> <p>Relatively high degree of literacy and numeracy skills are required if self-administered, although less than other methods.</p> <p>Estimating portion sizes may be difficult.</p> <p>FFQs developed in one country or for a specific subpopulation are unlikely to be appropriate for use in another country or subgroup unless dietary habits are very similar.</p> <p>The food list may not reflect the dietary patterns of the population to be studied, e.g. ethnic differences in a population may not be captured.</p> <p>Pre-prepared meals, e.g. ready meals or takeaway foods, may not be easy for respondents to classify.</p> <p>Validity can vary widely between foods and nutrients from the same FFQ.</p> <p>Grouping of foods into individual items may make answering some questions problematic.</p>

Potential sources of error and bias

It is important to understand that any method for assessing diet only provides an estimate of a complex behaviour. Therefore, wherever possible, it is important to identify and quantify sources of error in order to minimise them through careful project design and analysis. This is particularly important when assessing nutrient intake or total energy intake from food component intake. All tools should ideally have been previously tested for reliability and validity. Reliability refers to how consistently an instrument or tool will measure something on two or more separate occasions.¹⁷ Validity refers to how accurately the instrument records what is it intended to measure.¹⁸

Self-reports of diet are subject to a number of types of bias, including:

- recall bias (where a respondent may not remember things accurately)
- bias caused by lack of compliance (where some people might refuse to answer some questions)
- 'social desirability' bias (where people may be more likely to provide responses that they think are acceptable, rather than those that represent their real opinions or behaviour).¹⁹

The choice of measure will, to an extent, dictate the data collection method employed. Calculating total energy intake or nutrient values from weighed food diaries, for example, can be difficult and time consuming and may be impractical for many evaluations. On the other hand, questionnaires can produce estimated values for habitual consumption of particular foods relatively easily.

A number of dietary assessment tools have been developed by researchers, some of which are in the public domain while others can be used with the permission of the authors. Such questionnaires might offer practical solutions to evaluators looking for easy-to-use tools, but it is important to bear in mind any limitations, notably their lack of criterion validity^d and lack of sensitivity to measure the small changes commonly observed in public health interventions.

Further resources on dietary assessment

NOO has conducted a rapid review of the most appropriate tools for measuring diet in local-level weight management interventions. *'Measuring diet and physical activity in weight management interventions'*¹⁷ identifies a shortlist of practical and validated questionnaires for the assessment of physical activity and diet. It recommends six questionnaires for measuring children's diet and five for adults. The shortlist is based on best available evidence and highlights the strengths and limitations of each questionnaire.⁸

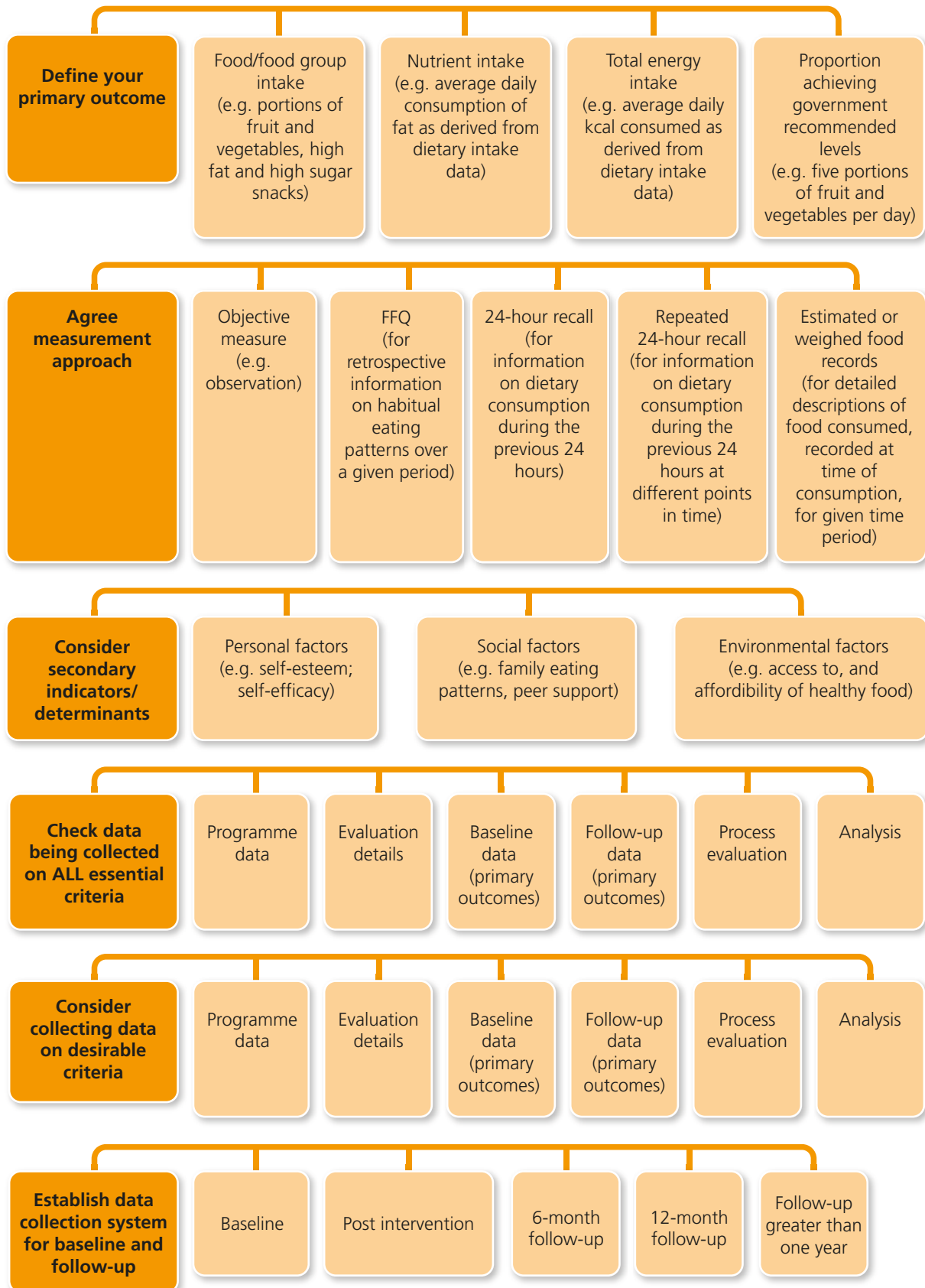
In addition, the MRC has produced an online *'Diet and Physical Activity Measurement'* toolkit that provides advice to researchers on the selection of appropriate dietary intake measurement methods. The tool provides details on the pros and cons of each method and links to publications and instruments.¹⁶

All tools will have some limitations, which should be described in any report so that the reader can make his or her own judgement about the validity of the results.

Figure 3 shows the process that should be followed when planning an evaluation – from defining outcomes to 12-month follow-up.

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^d Criterion validity describes how well the tool's measures compare to those considered 'gold standard', such as measures from doubly labelled water or weighed food diaries.

Figure 3: Flow chart (and examples) for data collection and analysis



4. The SEF for dietary interventions

This section of the document presents evaluation criteria necessary to undertake a comprehensive and robust evaluation. Essential criteria are the minimum recommended data required to evaluate a dietary intervention. Desirable criteria are additional data that would enhance the evaluation. Section 5 contains supporting information on each criteria and also provides guidance on collecting data.

Table 5: Evaluation criteria

Click on each criteria to link to the relevant supporting information and guidance.

	ESSENTIAL	DESIRABLE
Part one: programme details		
➤ 1. Title or name of intervention		
➤ 2. Aims and objectives (including primary and secondary outcomes)		
➤ 3. Rationale for the intervention (including theoretical basis and logic model)		
➤ 4. Contact details		
➤ 5. Commissioner(s) of the intervention and sources of funding		
➤ 6. Intervention timescale (exposure, quantity and duration)		
➤ 7. Intervention delivery dates		
➤ 8. Duration of funding (including dates)		
➤ 9. Location and setting		
➤ 10. Description of intervention: <ul style="list-style-type: none"> • target population • content • delivery method • deliverer • quality assurance mechanisms • assessment of potential unintended consequences 		
➤ 11. Method of recruitment and referral		
➤ 12. Participant admission/exclusion criteria		
➤ 13. Participant consent mechanism (and ethical approval)		
➤ 14. Equipment and resources required		
➤ 15. Core staff competencies (and training required)		
➤ 16. Incentives for attendance		
➤ 17. Detailed breakdown of costs		
➤ 18. Cost of the intervention per participant		
➤ 19. Cost to the participant		
➤ 20. Relevant policy context		
➤ 21. Details of health needs assessments		
➤ 22. Details of equality impact assessments		
➤ 23. Declaration of interest		
Part two: evaluation details		
➤ 24. Type of evaluation and evaluation design		
➤ 25. Methods and timings of data collection		

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	ESSENTIAL	DESIRABLE
Part three: demographics of individual participants		
➤ 26. Age		
➤ 27. Sex		
➤ 28. Ethnicity		
➤ 29. Disability		
➤ 30. Measure of socio-economic status		
➤ 31. Additional information (such as marital status and medical history)		
➤ 32. Details of parental dietary behaviour and weight (for interventions aimed at children)		
Part four: baseline data		
➤ 33. Measure(s) of dietary behaviour		
➤ 34. Measure(s) of correlates of dietary behaviour (if relevant to the intervention objectives)		
➤ 35. Other outcome measures (such as BMI; physiological/psycho-social measures; quality of life)		
Part five: follow-up data (impact evaluation)		
➤ 36. Follow-up data on key dietary intake measures (minimum of three follow-up points, including at one year)		
➤ 37. Follow-up data on key dietary intake measures over a greater term than one year		
➤ 38. Follow-up data on correlates of dietary behaviour (if collected at baseline)		
➤ 39. Follow-up data on other secondary outcome measures		
Part six: process evaluation		
➤ 40. Number of participants invited		
➤ 41. Number of participants recruited		
➤ 42. Number of participants attending each session or contact point		
➤ 43. Number of participants at each follow-up point, including final stage		
➤ 44. Reasons for opt-out (where relevant)		
➤ 45. Description of what was actually delivered and details of any unexpected outcomes		
➤ 46. Participants' satisfaction with the intervention		
➤ 47. Plans for sustainability		
Part seven: analysis and interpretation		
➤ 48. Summary of results compared to baseline (for primary and secondary outcomes)		
➤ 49. Details of any further analyses and statistical methods used		
➤ 50. Limitations and generalisability		
➤ 51. Recommendations and changes to future projects		
➤ 52. Dissemination of learning and findings		

5. Explanatory notes

This section provides explanatory notes for each of the criteria listed in Section 4. These notes are designed to help with collecting and recording the information required to complete the SEF. Particular issues for consideration are highlighted discussed.

Part one: programme details

1. Title or name of intervention

ESSENTIAL

Record of the name or title of the intervention, for example: 'Healthy Eating for Healthy Families.'

2. Aims and objectives (including primary and secondary outcomes)

ESSENTIAL

What does the intervention aim to do? What is the intended impact on dietary behaviours and/or health of the participants? What are the actions that will bring about this outcome?

3. Rationale for the intervention (including theoretical basis and logic model)

DESIRABLE

When developing and evaluating interventions, it is essential to have a clear understanding of the rationale for the intervention. This should provide an explanation as to how and why the intervention is supposed to achieve its objectives and includes the processes that will take place before any final changes in behaviour.

Being clear about the rationale for the intervention will also help to clarify or reinforce what the outcomes and appropriate measures should be. The use of 'logic models' (Figure 2) can be helpful in clarifying a rationale for an intervention with clear inputs, processes, outputs and outcomes.

For example, a project may aim to train adults to cook healthy meals. The rationale for this project could be that a high proportion of people said they would like to be able to prepare healthy meals but did not know how. The project would therefore aim to increase confidence and increase knowledge in how to prepare healthy meals.

In some cases, interventions may be based on: existing theories, such as behaviour change theory; literature, such as guidance from The National Institute of Health Clinical Excellence (NICE); or scientific evidence from peer-reviewed journals.

4. Contact details

ESSENTIAL

List the key people involved in the intervention planning, delivery and evaluation. This should include full contact information and details of staff positions (as individuals may change during or following the intervention).

5. Commissioner(s) of the intervention and sources of funding

ESSENTIAL

How is the intervention funded and who has commissioned it? For example: 'Funding is provided by the Department of Health and the intervention was commissioned by the local authority.'

6. Intervention timescale (exposure, quantity and duration)

ESSENTIAL

For how long does the intervention run? How many sessions, episodes or events are delivered? For example: 'The intervention is delivered in 20 two-hour sessions, twice a week for ten weeks.'

7. Intervention delivery dates**ESSENTIAL**

This includes dates for the initial recruitment of organisations (for example, GPs) and participants, first point of contact and any follow-ups.

8. Duration of funding (including dates)**DESIRABLE**

What are the start and end dates for the overall programme? The intervention may be run a number of times throughout the duration of the overarching programme.

9. Location and setting**ESSENTIAL**

Where is the intervention taking place? It could be in a GP surgery, school or community centre, or online. If it takes place in several settings, they should all be included here. It may be useful to add a description of any transport that is provided for participants to attend.

10. Description of the intervention**ESSENTIAL**

This section should include all the information about planned elements of the intervention, what the intervention intends to achieve, how it will do it, and the timing details of each element. Details should be provided, where applicable, of the following:

- Target population – what is the intervention’s target population? From which population were the participants recruited? For example: ‘Children aged 7–13 from the Anytown area who are overweight or obese’, or ‘Bangladeshi women living in a specific community.’
- Content – what is the intervention attempting to do/change, and how? For example: ‘The intervention will provide dietary advice and demonstrations of the preparation of healthy and affordable meals. Each session will be one hour long, once a week for 12 weeks. At weeks 4, 8 and 12, individuals will be offered a session of motivational interviewing.’
- Delivery method – for example, one-to-one sessions, face-to-face group sessions, by telephone, online or via the media.
- Deliverer – for example, a community nutritionist, school nurse, health trainer or local media.
- Quality assurance mechanisms – what mechanisms are in place to ensure that the intervention is being delivered in the way in which it was planned? For example, spot checks, audits carried out by an external assessor or participants’ satisfaction questionnaires. It is useful to provide details of any relevant health checks, risk assessments and Criminal Records Bureau checks if applicable. Also include the details of how any adverse events will be recorded and addressed.
- Assessment of any potential unintended consequences of the intervention – for example, if the programme is successful in increasing demand for school meals, this may present challenges to school caterers.

11. Method of recruitment and referral**ESSENTIAL**

How have participants been recruited to the intervention? Is there a referral process or is it self-selecting? For example, are participants referred by a GP or are leaflets and posters used to advertise in GP surgeries?

Give brief details here of any sampling processes that are undertaken. Is there any targeting of particular groups by, for example, advertising the intervention in certain communities or at specific locations? The method by which participants are recruited should be taken into account when conducting the evaluation. For example, a self-selecting group of participants may be more motivated than referred participants. Provide details here of the percentage of those that are eligible who have actually been recruited.

12. Participant admission/exclusion criteria**ESSENTIAL**

Some projects may have specific criteria which participants are required to meet in order for them to be eligible to participate. Participants who have been referred or have self-referred should meet pre-defined criteria. For example, the target population could be children aged 7 to 13 years from a particular location.

13. Participant consent mechanism (and ethical approval)**DESIRABLE**

It is important that participants give their consent to data being collected from them as part of the evaluation. The appropriate mechanism for gaining participant consent will vary for different groups of participants and according to the nature of the intervention. For example:

- those able to give their own consent
- those with parental responsibility giving consent on behalf of a child or young person under the age of 16
- those who lack the capacity to give consent.

Policy guidance on seeking consent from different groups, including people unable to consent for themselves, is available from the National Research Ethics Service website.²⁰

The Data Protection Act 1998 must be adhered to when collecting personal data from individuals, and a data protection statement should be given to participants before any personally identifiable data are collected. It should explain exactly which personal data are being held, why, where they will be held and who will have access to the data. This is particularly important when collecting sensitive data such as ethnicity and socio-economic status. More information about the requirements of the Data Protection Act 1998 can be found on the National Archives website.²¹

Some evaluation projects may be classed as research and so will require ethical approval from the National Research Ethics Service. Its leaflet, *'Defining Research'*, provides guidance on distinguishing between research, audit, service evaluation and public health surveillance.²²

14. Equipment and resources required**ESSENTIAL**

What equipment is needed to run the intervention? For example, is it necessary that a kitchen or food preparation area is available? Can the facility accommodate population groups with specific requirements (such as people with physical limitations or specific dietary needs)? Does the intervention require any equipment for measuring outcomes, such as calibrated scales to conduct a weighed food diary, or digital cameras to capture pictures of food and portions?

15. Core staff competencies (and training required)**ESSENTIAL**

How are those delivering the intervention recruited? What are the core skills needed by everyone involved in delivering the intervention? For example, does the intervention require the involvement of a registered dietician or community nutritionist? Other personal skills such as communication or facilitation may also be important. Do those staff delivering the intervention need to be trained in certain aspects of the intervention such as dietetics, counselling, childcare or youth work? Should they be trained to a specific level?

16. Incentives for attendance**ESSENTIAL**

Are any incentives provided to either recruit or retain participants, and if so, what are they? If incentives are used, it's important to record any evidence of their potential impact. This is important as incentives may influence the effectiveness of an intervention and the sustainability of any behaviour change.

17. Detailed breakdown of costs**DESIRABLE**

A detailed breakdown of the cost of the intervention is important for an economic analysis of the entire intervention and to judge if it is good value for money. It also enables commissioners to judge whether sufficient resources are available to run the intervention.

Take into account costs incurred during the planning and set-up stages as well as during the delivery and evaluation. Some examples of input costs are: staff time, transport, venue hire, equipment, publicity and incentives. It is especially important to factor in 'invisible' costs. For example, a room in a local authority leisure centre may be available free of charge as part of a partnership agreement. However, this resource needs to be taken into account so that, if the intervention is repeated, financial resources can be accurately planned.

NICE has a number of costing templates available that may assist with the accurate estimate of total costs.²³

18. Cost of the intervention per participant**ESSENTIAL**

This describes the total cost of the project divided by the number of people who have received this intervention. It should be based on real data where possible, with any estimates or assumptions clearly documented.

Costs should be calculated on the basis of the cost per person receiving the full 'dose' of the programme at follow-up – that is, recruitment, participation and completion of the intervention. It should also take account of the costs associated with non-completers. So, for example, if a project spent a total of £10,000 recruiting 100 people to a cooking skills course, but only 50 completed the course, then the cost per participant would be $£10,000/50 = £200$.

19. Cost to the participant**ESSENTIAL**

The cost to the participant should be recorded. This would include charges made to the participant for any part of the intervention (such as in some referral schemes), the cost of any necessary new equipment or clothing bought by the participants, or travel costs.

20. Relevant policy context**DESIRABLE**

It may be useful to show whether an intervention is part of a specific local strategy, or whether it addresses needs identified in the local Joint Strategic Needs Assessment.²⁴ Does it address national priorities or indicators such as those in the Public Health Outcomes Framework (PHOF)?²⁵

Relevant indicators in the PHOF include:

- 2.2 Breastfeeding initiation and prevalence
- 2.11 Diet (placeholder indicator)

21. Details of health needs assessments**DESIRABLE**

Has a health needs assessment been undertaken that identifies a need for the intervention or service? Information to support the rationale for the intervention may also be available from other sources. For example, data relating to health inequalities and gaps in service provision may already be available from local policies such as JSNAs.

22. Details of equality impact assessments**DESIRABLE**

Public bodies have a duty to undertake equality impact assessments (EIAs) under race, sex and disability equality legislation.²⁶ It is useful to provide an intervention's EIA as part of its overall evaluation. It can provide valuable information if particular outcomes are witnessed in different groups. It is also a 'practical way of examining new and existing policies and practices to determine what effect they may have on equality for those affected by the outcome'.²⁷

23. Declaration of interest**ESSENTIAL**

This covers any potential conflicts of interest and is particularly important if the evaluation is funded by an agency that could be perceived to have influence over the results for commercial reasons.

NICE has produced a clear statement covering different categories of potential conflicts of interest that should be declared, including pecuniary interests (where a financial payment or other benefit has been received) and non-pecuniary interests (where someone may have publicly expressed a clear opinion on the intervention in question, and this may influence their impartiality).²⁸

In general it is best to declare any potential conflicts, even if they do not appear to be important. Perceived conflicts of interest do not necessarily mean the intervention should not go ahead as planned; it may be acceptable to state how potential conflicts are going to be avoided.

Part two: evaluation details**24. Type of evaluation and evaluation design****ESSENTIAL**

The way in which an evaluation is designed to collect data, and the methods by which data may be compared with any control population, are very important considerations. For example, does the evaluation use mainly qualitative or quantitative data? Guidance is provided in Section 3 of this document and section 2.7 of the *SEF for weight management interventions* provides a more detailed explanation of evaluation designs.¹

It is also important to consider who is conducting the evaluation. Is it being evaluated by the same people running the intervention, or is it being externally, independently evaluated? An independent evaluation is always preferable as it is more likely to produce an objective view of the success of the intervention.

25. Methods and timings of data collection**ESSENTIAL**

Does the evaluation use qualitative or quantitative data? Which data collection tools are used – questionnaires, diaries, interviews, focus groups? It is useful to record how the baseline and follow-up data are to be collected and when. For example, are the data being collected using a self-report questionnaire or face-to-face interviews? How long is the follow-up?

Part three: demographics of individual participants

It is important to collect individual-level data on each participant in the intervention; this is typically collected at baseline. Data may be collected in the following categories:

26. Age**ESSENTIAL**

It is essential to record the age of all participants in the intervention. In most cases this means recording the actual age of the participant. If data are collected in categories (such as 0–4, 5–9) then these categories must also be used in the analysis.

27. Sex**ESSENTIAL**

Record the sex of all participants. This is useful to identify whether the intervention tends to be more effective for males or females, or if uptake of the intervention varies by sex.

28. Ethnicity**ESSENTIAL**

It is standard practice in public health interventions to record the ethnic origin of participants. If the intervention is targeted at a specific ethnic group, then a record of ethnic origin is essential for screening participants for eligibility. If the intervention is not targeted in this way, it is still important information to understand the extent to which the response to, and effectiveness of the intervention may vary between different ethnic groups.

In addition, there is a legal requirement to carry out ethnic monitoring. The Race Relations (Amendment) Act 2000 requires public bodies, including local authorities, primary care trusts and their partners to take account of race equality in policy making and service delivery. Ethnic monitoring is a way of identifying potential discrimination and whether policies promoting equality of opportunity and good relations between different racial groups are being implemented. For further information, see the Equalities and Human Rights Commission's website.²⁹ Ethnic category codes for England are defined by the Office for National Statistics.³⁰ These categories are listed in Appendix 1.

29. Disability**ESSENTIAL**

It is standard practice in healthcare interventions to record the disability status of participants. The Equality Act 2010 defines a disabled person as: 'Someone who has a physical or mental impairment that has a substantial and long-term adverse effect on his or her ability to carry out normal day-to-day activities.' Detailed guidance on the interpretation of this definition can be found on the DirectGov website.³¹

The Public Sector Equality Duty came into force under the Equality Act 2010 and requires all public bodies, including NHS trusts and boards, to actively look at ways of ensuring that people with disabilities have equal access to service provision. It may be particularly important to consider this duty when an intervention has been delivered by an external provider. More information is available on the Public Sector Equality Duty website.³²

Monitoring of disability, co-morbidities (such as diabetes) or long-term illness is important, as physical or learning difficulties in adults and children can confound the outcome of an intervention. In many cases interventions will need to be adapted specifically to meet the physical capacity of participants. It is also important to consider learning disabilities: children with learning or physical disabilities including conditions such as Prader-Willi or Down's syndrome may be at greater risk of obesity,³³ may be more susceptible to a nutritionally unbalanced diet,³⁴ and are likely to have lower capacity for physical activity.

30. Measure of socio-economic status**ESSENTIAL**

Diet can be influenced by a range of factors related to socio-economic status. It is recommended that measures are taken that attempt to understand the social factors that may influence the success of an intervention. It is also useful to monitor uptake of interventions by different socio-economic groups, to ensure interventions do not systematically exclude any groups through their design, delivery, recruitment or referral methods.

There are standard indicators of socio-economic status, such as the National Statistics Socio-economic Classifications (NS-SEC). However, collecting and analysing the data needed for this classification is likely to be too complex for most public health interventions. A more appropriate approach would therefore be to consider proxy variables for socio-economic status that may be relevant. Such proxy variables should relate closely to the purpose and nature of the intervention. It is important to ask the question: 'What

social and economic factors are likely to affect uptake of the intervention?', and then consider appropriate ways to measure these factors.

For example, for an intervention encouraging children to eat more healthily, it may be useful to collect information on social factors that may influence children's likelihood of eating healthy foods at school and at home – such as whether they access free school meals, whether both parents work full time or whether the family has access to a car (and therefore potentially has access to a wide variety of food outlets).

Other simplified proxy measures of socio-economic status include:

- Educational attainment.

This could use the Census categories; the age at leaving full-time education; or having a higher degree.

- Housing tenure.

The 2001 and 2011 Census split tenure into ten categories; these could be simplified into 'owner-occupied' and 'not owner-occupied'.

- Free school meals status

Analysis of these data can be complex, so it may be necessary to seek specialist help. Local public health analysts or researchers may be able to assist with this type of analysis.

31. Additional information (such as marital status and medical history)

DESIRABLE

Additional information can enhance the evaluation and provide an indication of possible confounding factors when analysing results:

Marital status/cohabitation

Data on marital status/cohabitation are a useful measure as there is significant evidence indicating that the BMIs and dietary habits of married people tend to be correlated and that men and women may increase weight when married.³⁵ It may therefore be useful to collect data on whether the subject is married (or cohabiting).

Medical history

This can include factors such as a participant having an existing clinical condition that is known to be linked with diet and obesity, such as type II diabetes. Relevant medical history information could be gathered from a participant screening questionnaire prior to an intervention.

32. Details of parental dietary behaviour and weight (for evaluations of interventions aimed at children)

DESIRABLE

Parental dietary behaviour, and weight status, may have a significant impact on their children, so this information can be useful and informative in some interventions.

Part four: baseline data

It is extremely important to collect baseline data before an intervention begins. If an intervention commences without baseline data it will not be possible to accurately assess its impact.

33. Measure(s) of dietary behaviour

ESSENTIAL

Baseline measures of dietary intake and behaviour should be made before the intervention begins. Details on selecting and measuring appropriate dietary outcomes can be found in Section 3 (pages 9–16).

34. Measure(s) of correlates of dietary behaviour (if relevant to the intervention objectives)

DESIRABLE

The vast majority of dietary interventions aim primarily to change dietary intake, so some measure of dietary intake should be the primary outcome measure. Most interventions will be based on a theory or an assumption about how the intervention will work. For example, it may be thought that a 'Cook and Eat' healthy meals intervention should try to increase participants' confidence in their ability to prepare healthy meals at home as it is assumed that confidence in cooking skills is a determinant of behaviour, and that improving cooking confidence may increase the likelihood of positive behaviour change. Therefore, as well as measuring the primary outcome (frequency of preparing and eating healthy meals at home), a secondary outcome measure could be confidence to cook healthy meals.

These measures are known as correlates as they are related to the primary outcome. A number of studies have explored possible correlates of dietary behaviour. While the evidence for their links to diet is not conclusive, it does provide some guidance on which factors might be relevant to specific interventions. This evidence is briefly outlined below.

Personal and social factors

A list of potential personal and social correlates of diet is included in Appendix 2. Some of the factors that have been examined for their association with diet include self-efficacy;³⁴ nutrition knowledge;^{36,37} economic status and income;³⁸ preference and greater perceived knowledge of cooking;³⁹ and mental health.⁴⁰

Environmental factors

Several theories have examined the 'nutrition environment' in terms of domains that influence eating behaviour. The nutrition environment has been described as having four domains:

- interpersonal (for example, peers and family)
- organisational (for example, school or place of work)
- community (for example, neighbourhood)
- society (for example, food prices and marketing).⁴¹

Environmental correlates may depend on the target group and the aims of the intervention. A list of possible environmental correlates can be found in Appendix 2. Environmental factors that have been studied for their association with dietary intake include family meal and eating habits,⁴¹ mealtime structure,⁴² home availability of healthy food,⁴³ local food availability,⁴⁴ and cost.⁴⁵

Examples of interventions, measures and outcomes operating at different levels of the nutrition environment are provided in Table 5.

Table 5: Examples of interventions in the four nutrition environments⁴⁶

Objective	Intervention	Examples of measure(s)	Example of outcome
Interpersonal domain			
Increase number of children eating home-cooked meals through parental education.	Healthy cooking classes with parents, providing information on importance of parenting style and family eating patterns on child's eating habits.	Number of attendees who cook a healthy family meal at least once a week.	Increase of 20% in proportion of attendees who prepare a family meal at least once a week.
		Number of attendees who feel that their family now eat more healthily.	Increase of 20% in proportion of attendees who feel that their family now eat more healthily.
Organisational domain			
Reduce the amount of fat consumed by employees whilst at work.	Reduce the amount of high-fat foods available in the work canteen and in vending machines.	Average daily grams of fat consumed by employees whilst at work.	Statistically significant decrease in the average daily amount of fat consumed by employees whilst at work.
Community domain			
Increase buying of fruit and vegetables in a local community.	Increase availability and affordability of fruit and vegetables locally through a food co-op scheme.	Number of local residents reporting that they bought fruit and vegetables at least once a week (pre and post intervention).	15% increase, from baseline to follow-up, in the proportion of residents surveyed who bought fruit and vegetables at least once a week.
Societal domain			
Reduce prevalence of obesity by decreasing consumption of sweetened drinks.	Introduce legislation to increase the price of sweetened drinks.	Number of individuals in the sample buying sweetened drinks on average five times a week or more.	10% decrease in the proportion of the sample buying sweetened drinks on average five times a week or more.

35. Other outcome measures**DESIRABLE**

Finally, it is worth considering other outcome measures in addition to dietary intake. Such outcomes should only be measured if they are relevant to the aims and objectives of the project.

Body mass index (calculated from height and weight) is listed in the *SEF for weight management interventions* as an essential criterion, as it is recommended that all weight management interventions should monitor body weight as part of their evaluation.¹ However, with dietary interventions it is only a desirable criterion, as interventions may aim to influence dietary intake without changing body weight. It is also important to note that body weight may not change dramatically in the course of a dietary intervention, particularly if physical activity levels remain stable and the change in dietary intake is small.

Other physical measures are sometimes taken to monitor changes in physiological measures due to changes in dietary intake. These include blood pressure; cholesterol or body fat percentage. These measures are beyond the scope of this document, as it is unlikely that most evaluations of community-based dietary interventions would have the resources to take physiological measurements. If such measures are taken, however, they should adhere to the appropriate clinical standards.

Quality of life has been shown to be related to dietary behaviour.⁴⁷ It can be measured using questionnaires, the most common of which is SF-36, a multi-purpose, short-form health survey with only 36 questions. It provides a profile of functional health and well-being scores as well as psychometrically-based physical and mental health summary measures.⁴⁸ Permission for use of the SF-36 is required from its copyright holders.

Other psycho-social measures such as perceived stress and depression have also been shown to be related to dietary behaviours.⁴⁰ Measurement of these sorts of outcomes should be considered carefully and appropriate tools used depending on the nature of the study and individuals targeted.

Part five: follow-up data (impact evaluation)

36. Follow-up data on key dietary intake measures (minimum of three follow-up points, including at one year)

ESSENTIAL

Part four describes the minimum data that should be collected at baseline, before an intervention begins. These key measures of diet behaviour should ideally be collected at least three times after the intervention has taken place. Typically this will be at the end of the intervention, then six and 12 months after the intervention has completed. Although measures from two data points can give some indication of change, it is not sufficient for accurate measurement of trends.

Also, the impact is likely to be greatest at completion of an intervention. To measure at this point only might give an artificially inflated indication of the intervention's impact. Behaviour change needs to be sustained to have significant health impacts, therefore it is important to check if behaviours that change at 12 weeks or six months are maintained in the longer term.

Where data on additional outcome measures have been collected (such as personal or social outcomes), these should also be collected at defined follow-up points.

It is important to collect follow-up data from as many members of the original sample as possible. The WHO Europe Good Practice Appraisal Tool recommends that follow-up is performed in a representative sample of the target group and includes more than 80% of the original intervention participants.⁴⁹

37. Follow-up data on key dietary intake measures over a greater term than one year

DESIRABLE

Ideally follow-up data should be collected over a period greater than 12 months. See point 36 (above).

38. Follow-up data on correlates of dietary behaviour (if collected at baseline)

DESIRABLE

See points 34 and 36.

39. Follow-up data on other secondary outcome measures

DESIRABLE

See points 35 and 36.

Part six: process evaluation**40. Number of participants invited****ESSENTIAL**

An important aspect of evaluating an intervention is to determine the flow of participants through the project. Accurate monitoring of participant numbers is often a weakness of published evaluations.⁵⁰ It is important to distinguish between interventions offered to the whole community and those offered only to a select group. How were participants initially recruited? How many individuals were invited to attend the intervention? If invitation/recruitment was via GP referrals or referral from a School Nurse, state the number of people who were advised to attend the intervention, or state if the invitation was via leaflets, posters or other publicity methods.

Recruitment information can be easily set out in a flow chart describing numbers of participants at each stage. Where possible, the number of participants invited should be categorised by age, sex, ethnicity and socio-economic position – to identify any possible inequality introduced during the invitation process. This is also the case for points 41 to 44 below.

41. Number of participants recruited**ESSENTIAL**

How many people applied to join the intervention or accepted the invitation? How many were screened? How many participants were found to be eligible for the intervention? How many actually enrolled?

42. Number of participants attending each session or contact point**ESSENTIAL**

How many participants attended each exposure, episode, session or contact point? For example, if an intervention is run twice a week for ten weeks, how many participants attended each of these sessions?

43. Number of participants at each follow-up point, including final stage**ESSENTIAL**

How many participants attended each of the follow-up stages for data collection? If high numbers of people drop out of the intervention, this can lead to biased findings. Some research studies define 'completion' as 75 per cent attendance of the programme/intervention.¹⁴

44. Reasons for opt-out (where relevant)**ESSENTIAL**

Whilst opt-out information is not easy to gather, it is important to understand why participants drop out of an intervention. It is particularly important if the intervention is to be run more than once, or as part of a rolling programme. Opt-out information can be collected in a number of ways and is similar to gathering information on participants' overall satisfaction with the intervention (see point 46).

45. Description of what was actually delivered and details of any unexpected outcomes**DESIRABLE**

Those delivering an intervention should keep a record of what was actually delivered. Such information may be collected via intervention diaries or logs of activities. The log is useful to identify if the planned intervention was changed in any way. It is also helpful to explain any changes observed in collected data, as these can be linked to project activity.

It is helpful to note whether there were any unexpected side effects or outcomes from the intervention. Unexpected outcomes do not necessarily have to be negative and there may be unanticipated positive health outcomes.

46. Participants' satisfaction with the intervention**ESSENTIAL**

Satisfaction questionnaires are frequently used as part of evaluations. It's important to find out if participants are satisfied/dissatisfied with the way in which an intervention is delivered, or unhappy with an element of the overall design of the intervention. Understanding which elements of an intervention were not popular will help in the planning of future programmes. Dissatisfaction may also lead to non-attendance and the intervention would then be less likely to achieve its defined outcomes.

When collecting data on participants' satisfaction, it should be noted that it is often very difficult to glean unbiased opinions from participants if there have been problems and difficulties. Therefore, any research of this nature should be carefully and sensitively conducted. To identify strengths and weaknesses of the intervention, it can be more useful to use qualitative methods such as focus groups or semi-structured interviews. Also, it is not advisable for the deliverer of the intervention to carry out the evaluation. Participants may feel more able to be honest with a person they have not previously encountered as part of the delivery team.

47. Plans for sustainability**DESIRABLE**

Consider whether plans have been made to ensure participants are offered the opportunity to continue with the intervention – perhaps through a follow-up group or referral to a permanent project. This will help the intervention's effects to be sustained over time. There may be resource implications for this type of long-term planning, and such information should be included in the evaluation.

Part seven: analysis and interpretation

No matter how good the quality of the collected data, it is vital that the data are correctly analysed and interpreted, otherwise they may not produce useful, robust information and feedback about the intervention. It is beyond the scope of this document to provide detailed guidance on data analysis. Readers should either seek the advice of a statistician or analyst, or consult published information on study design and statistical methods.

48. Summary of results compared to baseline (for primary and secondary outcomes)**ESSENTIAL**

The most basic type of analysis is to show whether primary and secondary outcomes have changed over the course of the intervention. The method for analysing and presenting results from the evaluation will depend on the study design. This in turn will determine the degree of confidence in the results. Section 2.7 of the *SEF for weight management interventions* describes the main study designs used for evaluations, and appropriate analysis methods.¹

49. Details of any further analyses and statistical methods used**DESIRABLE**

It is beyond the remit of this document to detail the statistical methods that could be used in the analysis of collected data. However when comparing outcome data with the baseline, or with data from other similar studies it is important to consider statistical significance: the extent to which we can be confident that a result did not occur by chance.

The use of confidence intervals (CIs) is a good way of presenting a level of uncertainty with data. CIs describe a range of values where there is 95 per cent confidence that the observed outcome is the true value. So, for example, there may be a mean change in kcal intake of 500kcal per day following an intervention, with 95 per cent confidence intervals stated as 400 to 600kcal. This means there is a 95 per cent likelihood that the true amount of reduced kcal intake is between 400 and 600 per day.

50. Limitations and generalisability**ESSENTIAL**

The generalisability of the intervention is the likelihood that the results of the intervention would be reproduced if the intervention were carried out with another group, or in the whole population. When assessing generalisability, it is important to take into account the target population, nature of the intervention, nature of sampling and recruitment methods, length of follow-up, and settings and resources needed.

51. Recommendations and changes to future projects**ESSENTIAL**

Finally, it is important to 'take a step back' from the project and consider what should be done differently next time. Are there key recommendations to pass on to those running similar projects in the future?

52. Dissemination of learning and findings**DESIRABLE**

It is important to share the findings of the evaluation to help build the evidence base for what works, and what doesn't work, to improve diet. This can be done through formal academic routes such as published papers and conference presentations, as well as feedback to the funders and partners.

Please share your results with NOO. We have developed an evaluation data collection tool for weight management, physical activity and dietary interventions, based on the fields presented in this and other SEF frameworks. Submitting your data will enable others to learn from your experiences and also provide you with an audit record of your intervention.

NOO also hosts a national searchable database of weight management, physical activity and dietary interventions. The evaluation data collection tool and the searchable database of interventions can both be found on the NOO website at www.noo.org.uk/core

6. Conclusions

We hope that this document has been helpful to those commissioning, running or evaluating dietary interventions. Our aim has been to establish the beginnings of a consensus on the minimum data required for robust evaluation and to help raise standards. It is hoped that this will contribute to the long-term aim of advancing knowledge on what works to improve diet, and to combat the rise of obesity and related disease in this country.

We welcome any comments on this document: please email info@noo.org.uk

Appendices

Appendix 1: Office for National Statistics categories for ethnic group monitoring in England^{e,30}

White

English/Welsh/Scottish/Northern Irish/British

Irish

Gypsy or Irish Traveller

Any Other White Background

Mixed/Multiple ethnic groups

White and Black Caribbean

White and Black African

White and Asian

Any other Mixed/multiple ethnic background

Asian/Asian British

Indian

Pakistani

Bangladeshi

Chinese

Any other Asian background

Black/African/Caribbean/Black British

African

Caribbean

Any other Black/African/Caribbean background

Other ethnic group

Arab

Any other ethnic group

.....
e At the time of publication many NHS data sources may not collect the full range of categories above. In particular 'Gypsy or Irish Traveller' and 'Arab'. These are new categories included in the 2011 Census.

Appendix 2: Examples of factors that may relate to dietary behaviour

Personal and social factors

- socio-economic status
- education
- income
- family cohesion
- self-efficacy/perceived control
- intention
- knowledge
- self-motivation
- attitudes
- beliefs
- preferences/tastes
- social support
- perceptions of quality of life
- body image
- global self-esteem
- mental health
- self-identity
- perceived effort/time.

Environmental factors

- types of food accessible (in the home, school, workplace, neighbourhood)
- types of food affordable
- eating habits of peers and family
- feeding styles (for young children)
- parental attitudes
- family meal habits and structure.

Glossary of terms

Aim

A broad statement of intent setting out the purpose of the project. For example: 'The project aims to reduce obesity by increasing the availability of healthy food in schools.'

Correlates

Measures that are related to the outcome of interest. For example, the outcome may be increased consumption of portions of fruit and vegetables; a correlate may be familiarity with a wide variety of fruit and vegetables. Interventions may then attempt to modify this correlate (for example, by providing participants with an opportunity to taste a variety of different fruits and vegetables).

Evaluation

Establishing whether a project has achieved what it set out to do.

Focus group

A group of people who discuss an issue, led by a researcher. Focus groups generate qualitative data. They are sometimes used in preference to individual interviews, as some researchers believe that a group dynamic will reveal more about people's beliefs and attitudes.

Impact evaluation

This focuses on whether a project has met its aims and objectives. This might be in terms of health outcomes, such as obesity, or impacts on health behaviours, such as increased physical activity or improved diet.

Interviews

A discussion between a researcher and subject(s), usually using a script or pre-designed list of questions, prompts and topics. Interviews can be face-to-face or by phone, structured (with fixed questions) or semi-structured (where discussion can be more flexible).

Monitoring

Collection of routine data that helps you assess whether projects are proceeding to plan.

Objective

A statement of exactly what the project is trying to achieve. For example: 'To increase the proportion of children who eat five portions of fruit or vegetables a day.'

Outcome

A visible or practical result, effect or product. It highlights the change or impact a project will have on the target population. For example: 'An average reduction of 2cm in waist circumference among project participants within six months.'

Outcome measure or indicator

A measure of something which demonstrates a change in a particular outcome. For example, the number of children who reduce the number of packets of crisps they eat each week.

Outputs

Things that the project produces, or activities that occur through the use of the resources in the project. For example: 'Ten healthy cooking and tasting sessions held in a community building.'

Process evaluation

Evaluation which focuses on the processes used throughout an intervention. It aims to identify why a project met or did not meet its aims and objectives; what went right and what went wrong; what can be learnt for future projects.

Qualitative research

Qualitative research provides information that is often reported in narrative form or which is based on descriptive information, such as diaries, open-ended responses to questions and field notes. Qualitative data are usually analysed using non-statistical methods.

Quantitative research

Research which measures and analyses observations to produce numerical or statistical data.

Reliability

The consistency of a measure. A measure is said to have a high reliability if it produces consistent results under consistent conditions.

Target population

The people the project aims to reach. These may be segmented by a number of factors including age, sex and social class.

Validity

The validity of a tool is the degree to which it measures what it claims to measure. For example, the extent to which a self-report food frequency questionnaire reflects actual dietary intake.

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