Evaluation of weight management, physical activity and dietary interventions:
an introductory guide

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This guide is based on a section of a previous publication by Public Health England – the Standard evaluation framework for Weight Management Interventions (SEF). It has been developed following feedback from users of the SEF and attendees of related training courses.

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Foreword

We seem to live in an age of evidence-based everything: everyone seems to want evidence that their intervention 'works'. New evaluations are one source of such evidence, but they can be difficult to get right. One particular problem is that every evaluation – even evaluations of very similar interventions – seems to use very different methods, and collect quite different data. This can make comparing findings between different studies a daunting task. It also makes it difficult to see how the wider evidence base fits together.

Evaluation is also daunting because it often seems that evaluations need to be methodologically perfect, but perfect evaluations are often not possible, and compromises sometimes have to made. Knowing this should not put us off evaluating, but should encourage us to try to limit the main sources of bias, and encourage us to collect the most reliable and most objective information possible. Unfortunately, many evaluation guides get lost in the methodological detail, perhaps because they forget that not everyone wants or needs to be an expert in study design.

This, and the standard evaluation frameworks, should help with these evaluation challenges because above all they aim to be practical, pragmatic, and comprehensible. The most common forms of evaluation have quite a simple objective: to find out what happens when an intervention is implemented. Such evaluations generally ask, 'What were the outcomes?' and 'How were those outcomes achieved, and at what cost?' There are many different evaluation approaches to answering these questions. Some of these approaches may or may not be feasible, or affordable, so hard choices about appropriate methods often need to be made.

This guide will help with those choices, and will undoubtedly help ensure that new evaluations collect meaningful, consistent data that is of real value to public health decision makers.

Prof Mark Petticrew, London School of Hygiene and Tropical Medicine

Introduction

This guide provides an introduction to the evaluation of public health programmes and interventions. It is written primarily for practitioners interested in evaluation of weight management, physical activity and dietary programmes, however it contains many general principles that may be applied to other public health areas.

This guide is part of a series of resources from Public Health England (PHE) developed to support the evaluation of weight management, dietary and physical activity interventions. Key resources in this area are the three standard evaluation frameworks (SEFs). The frameworks describe in detail the information and data that should be collected in order to produce meaningful evaluations.

Standard evaluation framework for weight management interventions
Standard evaluation framework for physical activity interventions
Standard evaluation framework for dietary interventions

This guide will be a useful first step for anyone new to the topic of evaluation or those wishing to refresh their knowledge of evaluation approaches. It is essential reading for those wishing to apply the SEFs to their project or intervention.

What is evaluation and why is it important?

In its simplest form, evaluation is about judging the value of an activity and assessing whether or not it has achieved what it set out to do.

Evaluation should not be seen as some sort of complex academic exercise, but more as a basic part of project management. In most cases evaluation is used to assess the extent to which a project has achieved its objectives. If a project has not achieved its objectives the evaluation will help to identify why that might be and what could be improved.

In public health settings evaluation can be used for a variety of purposes. Examples of public health interventions are given in Table 1 with potential questions that an evaluation may set out to answer:

Table 1: examples of public health interventions with potential questions that an evaluation may set out to answer

Intervention	Evaluation question examples
Weight management programme	Have participants lost or maintained weight? Do participants feel more confident in their ability to cook healthy food and be more active in the future?
New local authority policy	Is the policy being implemented? Are people changing their behaviour?
Physical activity or diet project	Is the project being implemented as planned? Are people from the target audience engaging with the project? Have there been changes in diet or physical activity?
Social marketing campaign	Did the campaign reach the target audience? Did the target audience understand the communications? Did the target audience act on the information provided?

Why evaluate?

Evaluation is important as it helps to demonstrate the value of an intervention, programme or policy. If we are to invest time and money in public health initiatives, it is important to know that they are having an impact and the investment is worthwhile, but evaluation is not just a simple matter of weighing up costs and benefits. It can also help us address a number of more subtle questions that depend on the type of evaluation being conducted, and the values that various stakeholders attach to the project. For example an economist may prioritise an assessment of the costs and benefits, while a project manager may be more interested in assessing the processes involved in the initiative and whether and how it can be improved.

Has the project achieved its objectives?

Do the benefits outweigh the costs? Is it value for money?

Is the project reaching the right people?

Is it working? If not, why not?

How can we improve the way the project is working?

Were there any unintended consequences (good or bad) ?
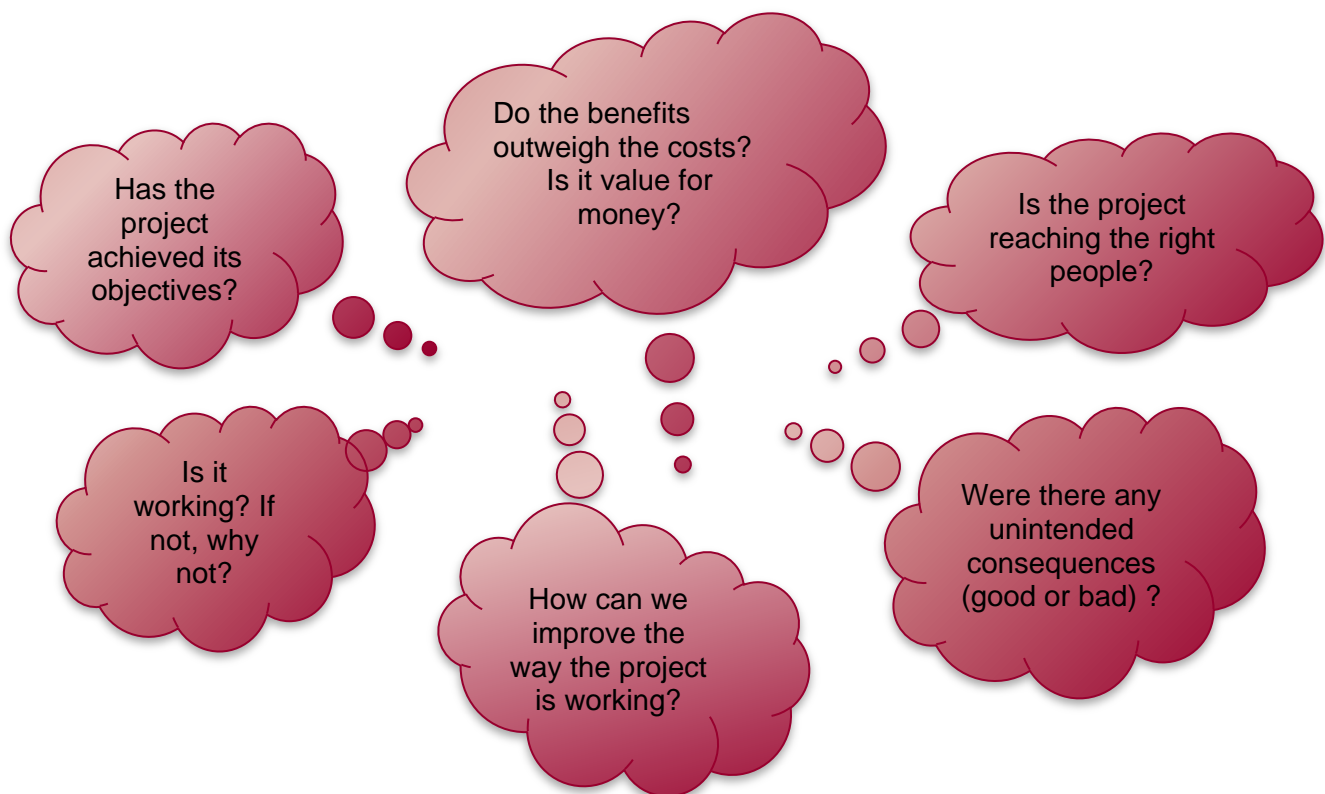
The results of evaluations can have a number of uses. They can for example, be used to refine a project and improve the way it is delivered; they can be used to provide feedback on progress to commissioners, funders or other stakeholders; or they can be published to help other people plan similar projects in the future. The priority attached to each of these uses will have an influence on the type of evaluation that will need to be conducted.

Process and outcome evaluation

The evaluation questions posed in the illustration above are a mixture of two of the main types of evaluation: *process evaluation* and *outcome evaluation* (the third type, *formative evaluation,* will be discussed later in this guide). It is important to consider right from the outset what sort of evaluation you wish to conduct.

Process evaluation seeks to explore what is happening within a project. It aims to provide an explanation of how or why intended outcomes of the project were (or were not) brought about. Process evaluation is often conducted while the project is still progressing, and in many cases is intended to feed into the development of the project. Process evaluation sometimes overlaps with *monitoring,* which is the collection of routine data. So for example, in a weekly weight management intervention it is vital to collect information on how many people attend each week, and compare this with the initial attendance to identify if people are dropping out. This can help to highlight issues which may be urgently addressed while the programme is ongoing.

Outcome evaluation focuses on the various impacts of the project over time. It assesses the progress of the project against its original objectives and determines whether it has had the intended results. Outcome evaluation tends to focus on impacts that occur after a greater length of time than process measures. Examples of process and outcome evaluation measures for a family healthy eating project are shown in Table 2.

Table 2: evaluation measures for a family healthy eating project

Process evaluation	Outcome evaluation
How many families attended the sessions?	How many participants reported that they had learnt how to cook a new healthy meal? (short-term outcome)
How do attendees rate the quality of the instruction?	How many participants said they would cook more healthily in the future? (short-term outcome)
Did the trainer deliver the session according to the agreed protocol?	After six months, did the participants report an improved diet, compared to before the project? (longer-term outcome)
Were there any problems with delivery?	

The standard evaluation frameworks produced by PHE are mainly concerned with outcome evaluation as they focus on the core data that needs to be collected to show whether a project has had an impact, but process evaluation is an extremely important component of evaluation that should be woven into the planning of every project. Prof Adrian Bauman – an evaluation expert and director of the World Health Organisation Collaborating Centre for Physical Activity, Nutrition and Obesity advises: "do process evaluation always; do outcome evaluation often". In other words every project should be subject to process evaluation, and if the resources are available, then consider outcome evaluation.

Prioritise process evaluation

<u>Every</u> project should be subjected to process evaluation.

If the resources are available, then consider outcome evaluation

Who wants to know? The importance of understanding the target audience for the evaluation

When planning an evaluation it is critical to think carefully about the target audience for the evaluation. Who are you conducting the evaluation for? What do they need to know? What will they do as a result? What sort of information do they need? Figure 1 illustrates three different perspectives on the impact of a project to promote breastfeeding-friendly public places.

Figure 1: differing perspectives on the impact of a project to promote breastfeeding-friendly places

"the project was successful as it led to a 21% increase in the proportion of local mums breastfeeding at six months compared to last year" **Dr Smith, GP**

"the project was successful as now I can look for a sign in a café window and I know I'll be welcome to feed my baby there" **Mrs Jones, new mum**

"the project was successful as I now do a roaring trade in the mornings from groups of mums who come in for a coffee, knowing that they can feed their babies in peace" **Mrs Wesson, café owner**

To obtain each of the evaluation results above would need a different method, collecting specific data from each target audience. It is therefore critical that the evaluation is planned from the outset with the target audience in mind, addressing the different perspectives of each stakeholder.

Evaluation and research: different perspectives

Just as stakeholders can come to a project with a variety of different perspectives, the people conducting an evaluation can also have different viewpoints and ways of conducting the evaluation. This guide is mainly concerned with introducing the reader to pragmatic evaluations of practical public health projects that are being delivered in practice as opposed to a research setting. The focus is therefore on understanding how well projects are being implemented; the extent to which they achieve their objectives; and how to modify projects to improve implementation in a real world setting. The outcome of this type of evaluation is generally used to feed into future projects, or to make the case for increased investment. This contrasts with a scientific approach to research where the emphasis is on contributing to the science of public health through addressing highly specific research questions. In most cases, researchers actually control the intervention itself as well as the measurement of key outcomes. The distinctions between scientific and practice based approaches are illustrated in Table 3.

Table 3: the similarities and differences between practitioner and scientific evaluations of health promotion programmes. Adapted from Nutbeam and Bauman[1]

Function	Practitioner perspective	Scientific/researcher perspective
Funding	Controlled by managers or other stakeholders	Usually grants from academic funders
Purpose of evaluation	To implement and improve programmes	To generate scientific evidence
Research methods	Pragmatic Often a mix of quantitative and qualitative methods May include perspectives of users and other stakeholders	Tends towards quantitative methods Use of advanced statistical techniques and methodologies Aim to reduce bias
Level of evaluation	Emphasis on formative evaluation and process evaluation	Emphasis usually on the project's impacts May extend to outcome evaluation, to provide evidence of project's effect
Resarch design	Flexible and pragmatic	Tightly controlled
Use of results	To improve (or perhaps abandon) the programme To disseminate to others so they can use them in settings or communities	Publication that contributes to scientific knowledge Dissemination to encourage replication to 'test' in other settings or communities

In reality there are many overlaps between the two different perspectives: evaluators may be very interested in publishing academic papers, while researchers frequently measure the impact of 'real-life' projects, however understanding the distinction between the two approaches can help to focus the evaluation more closely on what is most achievable and useful. To conduct a robust evaluation you do not need to be a researcher; you just need to be objective, ask the appropriate questions, and collect the relevant information at the right time.

Seeking help with evaluation

Practitioners may find there is a lack of hands-on help with an evaluation. Some projects rely on external consultants or academic bodies to support their evaluation design and also undertake the evaluation itself. This can be a good option although it is unlikely to be the cheapest. It may be worthwhile finding out if any expertise or support is available locally from a college or university, the local authority or a voluntary group. Such bodies may have students, volunteers or employees available to help design or implement your evaluation. Such support can contribute to a shared vision of an evaluation and enhance the project.

It is recommended that evaluation partnerships are established with all stakeholders involved in the project. With this approach, project managers and evaluators work together in a true partnership that aims to evaluate a project and make sure it continuously improves as learning is fed back into its development.

Evaluation: a step-by-step guide

This section will outline a step-by-step guide to planning, designing and conducting an evaluation. The process is based on the project development cycle developed as a tool to faciliatate project planning.

Figure 2: project development cycle

Step 1: planning

All good projects rely on careful planning. A key activity at the planning stage is to set out the 'bare bones' of the project in a short document. This should include:

- a description of the health issue to be addressed
- the prevalence of this issue and whether it affects certain socio-demographic groups disproportionately (sometimes called 'descriptive epidemiology')
- the aims and objectives of the project
- the evidence base for the approach to be taken
- if there is little evidence, the theory or idea upon which the approach is based
- the stakeholders to involved
- the resources available
- what is going to happen when
- what is going to be measured

See page 31 for an evaluation checklist.

Evaluation should be considered long before the project begins

It is all too common practice for evaluation to be forgotten in the race to get a project off the ground. This often means that there is no agreement on what should be measured, and the opportunity to collect baseline data before the project has any sort of impact has been missed forever. If at a later date a commissioner then asks for information about the project's achievements, this can be difficult to demonstrate. It's also hard to relate back to what was originally planned and how the project was intended to progress. By setting this all out 6 to 12 months before the project begins, evaluators can then collect information and data on the situation prior to the project, and demonstrate more robustly the difference that the project has made.

A critical aspect of the planning phase of an evaluation is to attempt to define what each stakeholder hopes to gain from the project and what outcomes they value. A good way to manage this is to have a meeting of all the stakeholders involved in a project before it starts. Ask each person or group of people to think about how they would define a successful project, and then use this as a basis for planning the evaluation. Are you able to collect the data needed to demonstrate success to each of the stakeholders? If not, what modifications need to be made?

The elevator test

Use the elevator test to think ahead to where you want to be when the project is complete. Imagine you find yourself in a lift in three years time with your boss, who asks: "how is that project going?" You have one minute to impress. What would you want to say?

Example one: "we reached 88% of the target audience with our materials and recruited 467 women over two years. Sixty five per cent of them attended the full 12 week programme, with 88% achieving 5% weight loss at 12 weeks. Half of whom kept the weight off at six months."

Example two: "we've just held the last of the focus groups and these have shown that the women found the course to be highly motivating and empowering, and seemed to fit in well with their lives. Most of them had made changes to their diet and physical activity and felt that this had given them the skills to control their weight for the rest of their lives".

These two statements are clearly very different, and would require quite different approaches to evaluation.

Budgets

A critical part of project planning is securing the budget. This should include adequate funds for an evaluation. There is no general consensus on an appropriate scale for evaluations. The World Health Organization suggests at least 10% of the total project budget should be dedicated to its evaluation,[2] others, however, have

pointed out that in some cases this type of guideline figure is inappropriate.[3] Having adequate resources for an evaluation results in a greater choice about which elements of a project can be evaluated.

Step 2: setting objectives

One of the most critical aspects of good project planning is the setting of clear aims and objectives. One of the main functions of evaluation is to establish whether objectives have been achieved, so setting clear objectives from the start has a major influence on the evaluation. Also, without clear objectives projects are likely to stray off track and lose focus. Well before a project begins, it is helpful to get together with all the partners involved to agree aims and objectives. These might have to be re-written several times before they are right and can be agreed by all partners.

Aim	**Objectives**
This is a general statement that describes the overall intention of the project. The aim can often be relatively vague, as it describes generally what the project hopes to achieve rather than what will be done.	These are much more specific than the aim, and set out what is going to be undertaken, and precisely what you hope will be achieved. Most projects can be summarised in a maximum of one aim and between three and five objectives. If a project has more than five objectives it may lack focus.

The objectives set for a programme should be SMART:

Specific	what precisely do you want to achieve? What is the precise or specific behaviour, achievement or outcome that you hope to change? Can this be presented in numeric quantitative terms?
Measurable	are you able to measure whether the objective has been achieved?
Achievable	are the objectives achievable given the resources available?
Relevant	are the objectives the most important things you could be focusing on?
Timely	when should the objectives be met?

It is not usually essential for every single objective to be SMART on its own, as some objectives may set out intermediate steps on the way to achieving the aim. What is more important is that the whole set of objectives is specific, measurable, achievable, relevant and timely. SMART and not-so-SMART objectives are illustrated in Table 4.

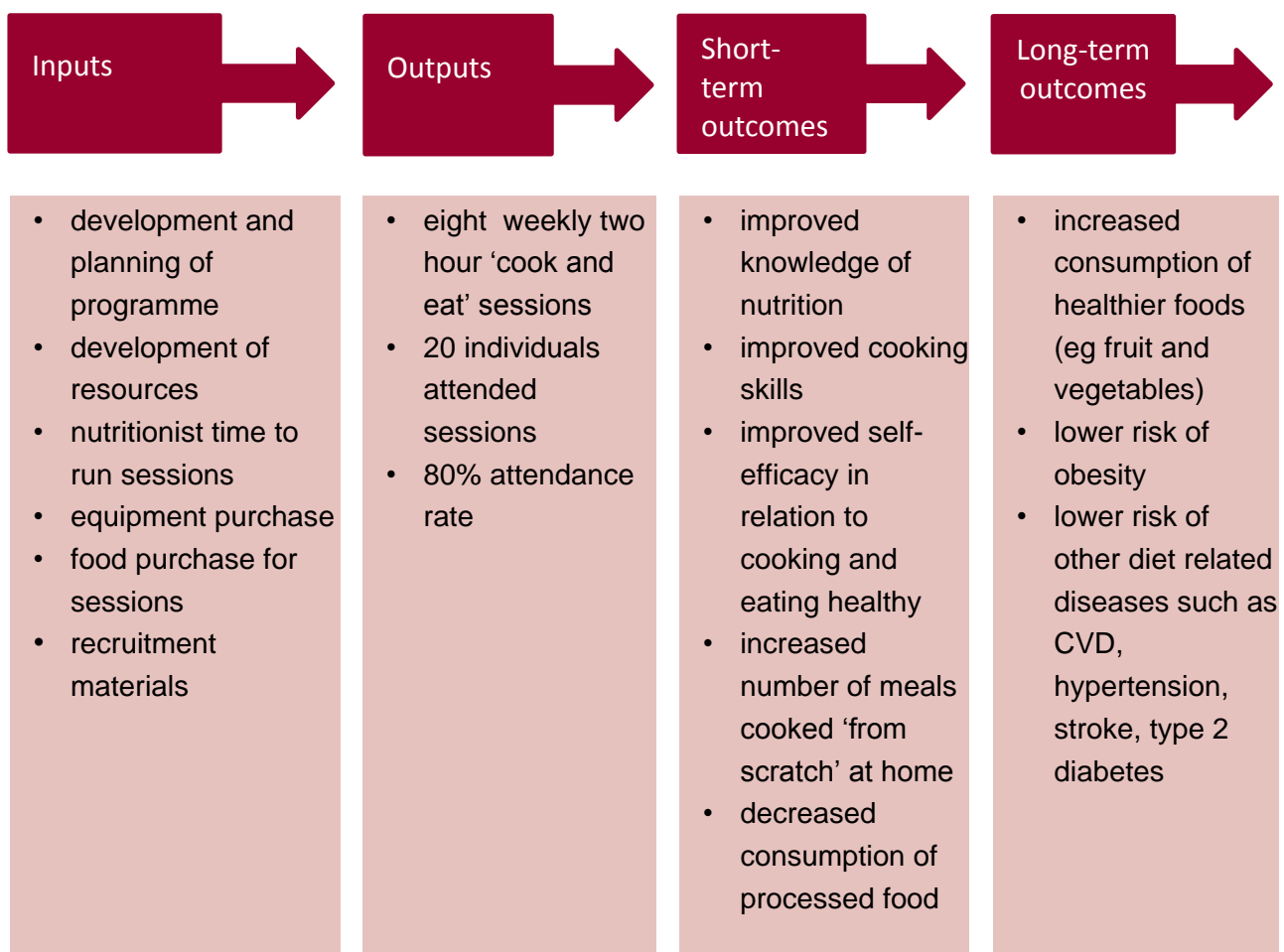**Table 4: examples of SMART and not-so SMART objectives**

Aim: to improve the availability of healthy food in schools across the local authority	
SMART objectives	**Comments**
1. Conduct an audit of the provision of healthy food in all schools across the local authority 2. Publish criteria for minimum healthy food standards in line with national guidance and agreed by local stakeholders 3. Train school caterers in the implementation of the new standards 4. Ensure 50% of schools in the local authority have been trained and have agreed to implement the new criteria by [date] and 90% by [date]	Each objective sets out one clear action. Where possible they are specific (eg criteria need to be in line with national guidance). Objective 1 specifies all schools. Action words are used eg conduct; publish; train. Final objective sets clear measurable outcomes by dates
'not-so-SMART' objectives	**Comments**
1. Explore what food is available in schools locally 2. Draft a document setting out how to make school food healthy 3. Hold seminars for caterers 4. Get as many caterers to provide healthy food as possible	Vague, unclear, with lots of room for movement. Vague words such as *explore* and *draft*. These objectives could be achieved in a week, or conversely could take a lifetime

Logic models

It is also helpful at the beginning of a project to draft a logic model. A logic model is a simple planning tool that describes the relationship between each element in a project or intervention and the likely direction of change. It provides a logical roadmap that anticipates how each project element will work, what the result will be and how the sequence of elements will lead to the expected outcomes. This enables the evaluator to focus on collecting data to measure indicators at each stage and relate these measures to the overall project plan. It also allows the evaluator to question the assumptions inherent in the project plan. A simplified example of a logic model is shown in Figure 3.

Figure 3: example of a simplified logic model for a 'cook and eat' programme

Inputs	Outputs	Short-term outcomes	Long-term outcomes
• development and planning of programme • development of resources • nutritionist time to run sessions • equipment purchase • food purchase for sessions • recruitment materials	• eight weekly two hour 'cook and eat' sessions • 20 individuals attended sessions • 80% attendance rate	• improved knowledge of nutrition • improved cooking skills • improved self-efficacy in relation to cooking and eating healthy • increased number of meals cooked 'from scratch' at home • decreased consumption of processed food	• increased consumption of healthier foods (eg fruit and vegetables) • lower risk of obesity • lower risk of other diet related diseases such as CVD, hypertension, stroke, type 2 diabetes

The difference between inputs, outputs and outcomes:

- **inputs** describe the resources that are required for example budget, time, staff, premises
- **outputs** are things that are to delivered or the activities that are to be carried out. This includes people attending sessions or interventions. Do not get these confused with outcomes
- **outcomes** are the changes that you hope will occur as a result of the outputs. These can be short term – such as a change in knowledge or attitudes, or longer term such as changes in behaviour or health status

Step 3: selecting indicators

The next step in the planning process is to think about what you might need to measure to assess the impact of your intervention.

Key measures that you might use are called **indicators.** Like the indicator on a vehicle, they show the direction the intervention is taking. Indicators can be the measures of the final desired outcomes of a public health intervention, as well as any of the intermediate objectives leading to this final outcome (as set out in the project's logic model).

The agreed set of national priority indicators has been published as the Public Health Outcomes Framework (PHOF).[4] The PHOF is a large set of agreed national indicators that will help increase understanding of how the health of the public is being improved and protected. The PHOF provides a clear national framework for programme planning. It can be very helpful to relate local level initiatives to these national indicators as far as possible.

Process indicators then need to be selected to measure progress along the way to making a difference to the headline indicators. Process indicators should assess the processes taking place as the project is implemented. It is important to make sure adequate emphasis is given to process indicators – to ensure that the programme is being implemented as planned. Table 5 gives examples of reaching the right people.

Table 5: indicators for a family-based healthy eating and physical activity intervention

A local authority wishes to focus on Public Health Outcomes Framework indicator 'excess weight in 4-5 year olds'. This is defined as the percentage of children aged 4-5 years classified as overweight or obese. The indicator is measured nationally using the National Child Measurement Programme.

To address this issue, it was decided locally to implement a programme of 'mother and toddler' healthy eating and physical activity interventions in identified deprived communities. Mothers would be identified through community organisations and outreach work, and invited to attend specific sessions. The indicators for this project are set out below:

Process indicators:	Short-term outcome indicators:	Medium-term outcome indicators:	Long-term outcome indicators:
• number of mums invited • number of mums attended one or more sessions • number of mums attended more than five sessions • % of attendees from identified deprived communities	• % of mums saying they found the sessions helpful • % of mums confident in their ability to prepare healthy meals on a budget • % of mums who agree that an hour a day of exercise important for 4-5 year olds	• % of mums saying that they cook healthy meals 'most days' • % of mums saying their children are active for an hour a day	• % of children aged 4-5 to five classified as overweight or obese

In the example above, it can be seen that the **process indicators** measure what happened as part of the project, but don't really report any impacts on the attendees, however they are an essential part of the evaluation. If no mums attended the sessions they would not be exposed to any of the interventions about healthy eating and physical activity. Process evaluation therefore should be undertaken as the intervention is progressing, and fed back to the project management team, who can then make adjustments to the delivery of the project to ensure it remains on track.

Short-term outcome indicators might be measurable quite quickly (at the end of a session or programme - such as the percentage of mums finding the sessions helpful) and relate to the next stage in the logic model. In this example the measures are of attitudes or knowledge about the topic. **Medium-term outcome indicators** then relate to outcomes such as behaviour changes (in this case changes in cooking and activity habits) while the **long-term outcome indicators** usually focus on a measurable health outcome.

Sources of data for indicators

Data for indicators can come from a variety of sources, including:

- existing sources of information - these can include project attendance registers; GP practice data; local authority data; national surveys; data from hospital episodes statistics; local data such as the active people survey or locally commissioned surveys
- new information collected for the evaluation - via surveys; questionnaires to service users; interviews; focus groups; case studies; visits to projects and so on

Indicators can be both direct and indirect measures:

- direct measures can be observed and are not open to interpretation, such as height and weight, or steps walked
- indirect measures rely more on interpretation, such as attitudes about a service, or self-assessment of diet

Standard evaluation frameworks

Recommendations for appropriate indicators for weight management, dietary and physical activity interventions are set out in Public Health England's standard evaluation frameworks (SEF):

- SEF for weight management interventions (published March 2009)
- SEF for physical activity interventions (published September 2012)
- SEF for dietary interventions (published September 2012)

The most important check when selecting indicators is to think: "does this set of indicators help me evaluate the intervention?" Refer back to the intervention's objectives and check that the indicators are focused on the objectives.

Step 4: design methods and collect data

Once the key indicators have been agreed for the project, the next step is to decide on the type of evaluation that you are going to carry out, and then how to collect the data.

Types of evaluation
There are three principal types of evaluation:

Formative evaluation
The purpose of formative evaluation is to define what is likely to be effective in a project. It is carried out long before any project commences, and involves researching, developing and testing the materials and methods that you intend to use in the project. It is often undertaken in close consultation with the target audience and involves discussions and feedback about the key elements of the project.

Formative evaluation can include any of the following approaches:
- needs assessment research
- target group mapping or profiling
- pre-testing of materials
- piloting
- focus group discussions
- informal discussions with target group members
- exploration of barriers and motivators
- readability tests

"Understanding the needs of the target audience and using formative research to develop appropriate and accepted intervention methods and materials is an essential first step in designing an effective intervention."

Don Nutbeam and Adrian Bauman. Evaluation in a Nutshell. (2006)[1]

Process evaluation

As previously stated, this is a critical and often under-emphasised aspect of evaluation. Process evaluation describes what happens when a project takes place. It focuses on describing and investigating the process of implementation, especially to explore whether the project has been implemented as planned. Every project should conduct some degree of process evaluation as it is the essential first step in understanding how and why a project was effective/less effective.

Process evaluation can involve a wide range of methods:

- checking attendance data to ensure the project is reaching the target audience
- collecting evaluation forms or customer surveys after an event
- discussions with participants of the project about their satisfaction with the service
- analysis of project documentation to see whether the project is being delivered as planned

Process evaluation can help us to understand **why a change took place**, and can provide some insight and context to outcome evaluation. Outcome evaluation will simply show that a change has taken place, but will not explain the mechanisms behind the change.

Table 6: example: healthy eating menu changes for school children

Objective	• to improve the diet of school children by offering free salad with every meal
Result of outcome evaluation	• no increase in the proportion of children eating a portion of salad per day at school lunchtime
Questions a process evaluation could help to answer	• did the number of children eating school lunches stay the same? • was the salad choice available every day? • were children offered the salad? • was the salad in a convenient location, was it easy for children to help themselves? • did children like the salad? • were there other factors (such as peer pressure) that stopped them eating the salad?

Process evaluation can also help to separate projects that are not effective from those that were simply not delivered properly. For example, a healthy eating project

may have the best possible materials, trainers, theory and delivery methods, but if it is not advertised well and no one attends the sessions, it is unlikely to succeed.

Process evaluation thus has to take place while a project is progressing with the results feeding back into the project. In the example above, as well as providing context and explanation for the negative results, process evaluation will enable project implementers to adjust elements of the project to increase its chance of success.

Process evaluation tends to address the following elements:[1]

- **exposure**
  Were the target audience exposed to the project? Did they understand what was being asked of them and what was being offered?
- **participation**
  Who took part in the project? How many people attended? Were the participants from the target audience? Did the project reach the intended socioeconomic groups?
- **delivery**
  Was the project delivered as planned?
- **context**
  Were there background issues that affected the uptake of the project?

When planning a project, always set out to undertake thorough process evaluation, before going on to assess whether the resources exist to undertake an outcome evaluation.

Outcome evaluation

This is perhaps the most commonly understood type of evaluation: assessing whether or not a project has had the intended outcomes. Outcome evaluation focuses on the various impacts (or outcomes) of a project over time. Using the logic model outlined on page 17, it assesses whether there are observed changes in any or all of the agreed indicators, and attempts to measure these as far along the logic model as possible. Whether the evaluation assesses short-term or longer-term outcomes depends on the time available. It can take years to be able to measure some health outcomes such as changes in rates of cardiovascular disease, whereas changes to various behaviours like diet or physical activity, can take place over a much shorter timeframe.

The main challenge with outcome evaluation is being able to say with confidence that any changes observed were likely to be a direct result of the project and were not due to other factors. This challenge is addressed through appropriate evaluation design, and is explored in the next section.

Designing a pragmatic evaluation

The design of an evaluation is critical as it makes a difference to the confidence we have in the final results - and consequently to the conclusions that may be drawn from these results. The design affects the extent to which we can be confident that the outcomes of the project were a result of the programme or intervention – and not due to chance or other factors beyond our control. For example economic conditions can influence food purchasing, and the weather can influence physical activity participation.

Pragmatic evaluations are those that tend to select the most appropriate evaluation methods and approaches according to the resources available. In many cases this might involve some form of compromise to address the needs of different stakeholders and deliver the programme and evaluation within the time and budget available. There is much debate about appropriate methods for pragmatic evaluations, particularly the use of control groups. Bodies such as The National Institute for Health and Care Excellence (NICE) and Nesta have published evidence hierarchies that give differing emphasis to particular study types. What is clear, however, is that for the evaluator there are two main points to consider:

- first, agree a strong programme of process evaluation - without this you will not know whether or not the project was implemented as planned and reached its intended target audience
- then agree the strongest possible evaluation design, depending on resources available

There are no 'right' or 'wrong' evaluation designs, but a stronger evaluation design increases the confidence with which conclusions can be drawn from findings. In particular a strong evaluation can indicate that a project's outcomes are a result of the project/intervention and did not occur by chance or due to some external factors.

Experimental designs

It is generally acknowledged that the strongest scientific evidence comes from experimental designs, and specifically randomised controlled trials (RCT).[1] Participants or groups of people are randomly allocated to receive an intervention (intervention group) or not (control group). Changes in the intervention group are compared against changes in the control group. This reduces the possibility that the changes were due to an external factor or 'confounder' and increases confidence that they were caused by the intervention itself.

RCTs are not the focus of this document. Although they have been used in public policy evaluations,[5] RCTs are primarily used by academic researchers who are able to control most of the elements of the intervention, which is generally conducted in a research rather than real-life setting.

Quasi-experimental designs

These types of designs tend to be more feasible for evaluations of projects in real-life settings. Quasi-experimental designs may use a control group but unlike the RCT, do not randomly allocate participants to either an intervention or control group. For example, in a community-based weight control programme the findings might be compared to a similar community, group or setting where there was no intervention. This increases the risk that changes in outcomes are due to the differences between two communities or other external factors. There may be something different about the comparison community that can bias your results, however a quasi-experimental design does make an evaluation much more manageable than an RCT and is a commonly used technique.

Comparisons could also be made with other measures in the same population, rather than from a specific control group. For example data from before and after a weight management intervention could be compared to trends in national height/weight data. Groups of people seldom lose weight without intervention; if anything, secular changes point to group increases in weight. Therefore, if this trend has been reversed it is more likely to have been specifically due to an intervention.

Can you compare outcomes from your project with data from any sort of comparison group or population? This will make the results more robust.

Pre-experimental designs

These types of evaluations provide weaker evidence and should only be used when all other possibilities have been explored. Pre-experimental designs include a pre-post assessment (where data are collected before and after an intervention). This is a design that can be used for very large evaluations such as an evaluation of national programme. In areas like obesity management pre-post evaluations can still be informative, as observed and significant weight loss does not usually occur by itself and is likely to be due to an intervention or project.

The weakest design is a post-intervention only study – where data are collected after the project has taken place. This type of design cannot be used for assessing a project's effectiveness although it can provide some useful information such as on participants' satisfaction.

In all evaluations the design selected will be determined by the resources available (including budget and the skills of those involved). The perspectives and needs of the project stakeholders should also be taken into account. In most cases, a mixture of evaluation design will be most appropriate.

Post-only evaluations should never be used for assessing a project's effectiveness or impact because there is no measure prior to the intervention and change cannot be assessed.

Collecting data

Data can be drawn from existing surveys or data sources such as routine attendance data or local level surveys. In most cases, however, an evaluation will need to collect new data. An evaluation is likely to include a mixture of methods for collecting the different types of information it needs, combining objective data with data from surveys, underpinned by qualitative data that investigate the processes and context in more detail.

Collecting quantitative data

Some of the data for an evaluation is objective and can be measured directly – such as height and weight. Most data however cannot be observed or collected directly and will need to be indirectly collected. The most common method for indirect data collection is via questionnaire or diary survey completed by programnme participants or by an interviewer. Interviewer data can be collected face-to-face using traditional pen and paper or via the telephone. Nowadays participants tend to self-complete questionnaires online or by mobile phone app.

It is important to seek expert advice on questionnaire design as there are many issues that can affect the quality of collected data and subsequent ease of analysis. For example open-ended questions can yield valuable qualitative information but are difficult to analyse.

One of the most important issues to consider when using a subjective measurement tool such as a questionnaire, is whether or not its reliability and validity have been tested. Such tools should be tested to ensure that they measure the same thing each time they are used and that they accurately reflect the 'truth' of what they are measuring. Questionnaires are also stronger if they have been validated with the population group in question. It is better to use a validated questionnaire than to invent your own questions as your results will be more informative and comparable to other studies.

The measurement of behaviours such as diet and physical activity presents particular challenges. In order to provide guidance on this topic, PHE has conducted a review of validated questionnaires for the measurement of diet and physical activity:

- download the Measuring diet and physical activity in weight management interventions
- download: Supplement (copies of questionnaires)

It is important to aim to collect data for at least the minimum set of indicators set out in the relevant standard evaluation framework:

- SEF for weight management interventions (published March 2009)
- SEF for physical activity interventions (published September 2012)
- SEF for dietary interventions (published September 2012)

Collecting qualitative data

Qualitative data can be invaluable to provide insight into the workings of a project. It is particularly valuable for process evaluation and for providing context and explanation for quantitative outcomes.

Qualitative information is usually collected through semi-structured, face-to-face or telephone interviews or focus groups, however qualitative data can also be collected through more creative methods such as video, photographs, drawing, storytelling or role play. Again, it is important to seek help from someone experienced in qualitative methods and analysing qualitative data before you begin to collect data. A list of data collection 'dos and don'ts' is given in Table 7.

Table 7: data collection: some dos and don'ts

Do	Don't
Collect data to reflect your aims and objectives	Start the project without collecting baseline data
Collect data on at least the essential criteria in the SEF	Try to collect data on everything
Use a validated questionnaire if possible	Choose a questionnaire first and then decide what to measure
Test any questionnaire with the target audience	Collect lots of data and then don't analyse it or report it
Make sure you have the systems in place to collect the data from project participants, at the right time	

Ethics

An important part of any research or evaluation study is the consideration of ethical issues. These are issues that may have an impact on the rights, safety, dignity and well-being of actual or potential participants in a study.[6]

In the NHS, ethical considerations are governed by the National Research Ethics Service (NRES), part of the Health Research Authority. The NRES manages a formal process of approval for research in the NHS. Most research involving NHS patients must be formally approved by a research ethics committee before it can begin. Evaluators should check with the NRES to determine if their project requires approval. There are exceptions if a project is a 'clinical audit' or a 'service evaluation' rather than research. Guidance is available on the NRES website.[7]

If a university is involved in an evaluation, they will often require the project to be approved by the University ethics committee (regardless of whether or not it is being considered by the NRES).

Regardless of the need for formal ethical approval, it is critical to consider ethical issues when designing an evaluation. Considerations should be given to some very basic questions:

- will the data be confidential and anonymous?
- will the question you are asking offend or upset people?
- will your data collection methods allow respondents to give you additional information that they consider important?
- do the questions and approaches respect people's backgrounds, literacy, and experiences?
- what will you do if someone discloses something that gives cause for concern?
- have participants given consent to the data being collected?

More detailed guidance on ethical issues is available from the Research Ethics Guidebook.[8]

Step 5: analysis

The next step in the evaluation process is to analyse the data you have collected. The type of data you have collected and type of evaluation you are undertaking will determine when analysis should be conducted. For example with process evaluation, it is important to analyse the data as the project progresses so that you are able to inform the development of the project. With outcome evaluation, analysis of the data is usually undertaken towards the end of the project or at a specified review date.

This guide can only provide a basic introduction to the issues of analysis. It is recommended that you seek expert assistance in data analysis at an early stage in the process regardless of the type of data you are collecting. A data analysis expert will want to discuss some key issues about your data such as:

- what type of data are you collecting? Qualitative or quantitative? If quantitative, are the data categorical (for example percentage of sample overweight and obese) or are the data continuous (for example mean BMI of the sample)? Do you have pre-intervention and post intervention data? What is the sample size?
- what level of analysis is required? Are statistical tests required and if so, which tests are appropriate (confidence levels, t-tests)?
- will the data need to be summarised or manipulated to communicate the results? How do you want the data to be presented? Bar charts? Pie charts? Scatterplots?
- what are the limitations of what the data can tell you? Can you be confident in the results?

Some of these issues depend on the target audience for the evaluation report. Who do you hope will read your report? Do you know how they like to see information presented? Do they prefer to see quantitative data or quotes from qualitative data, or both?

Qualitative data can provide an extremely important component of an evaluation, but it requires skilled researchers to collect and analyse it properly. It is essential to analyse qualitative data so that it summarises the themes that emerged from the data, and not simply to pick quotes or extracts that support a single viewpoint.

Overall, when analysing data it is critical to keep the evaluation objectives in mind. What question are you trying to answer? What can you say with confidence from the data? What question are you trying to answer? Keep this in mind rather than analysing and writing up everything that looks interesting.

Step 6: reflection and sharing

The final stage of the evaluation process is to reflect on the findings and share them with key audiences – especially the participants in the project. Depending on the purpose of the evaluation, findings can feed into the decision-making processes regarding the direction of an intervention or project. Table 8 provides examples of evaluation dissemination methods.

Table 8: examples of evaluation dissemination methods

Purpose of evaluation	Example of dissemination activity
Process evaluation of an ongoing project	• paper or report to the project managers making recommendations for changes
Assessing whether a pilot project reached its target audience	• presentation to project advisory board • talk to project participants to feed back results • YouTube clip
Assessing the cost-effectiveness of a project	• draft paper for finance committee • consider paper for academic journal • tweet results with link to reports

As well as communicating with the stakeholders involved in the project, it is always worth considering whether what you have learned from your evaluation will be of interest to a wider audience. Could you write up your findings or experiences for a journal or present them at a conference?

In most cases it will be necessary to produce an evaluation report. This should contain the key elements of the evaluation, ideally agreed with the evaluation advisory group at an early stage:

- summary
- background and context
- aims
- methods
- project delivery details – outputs and outcomes
- results
- case studies, successes, lessons learnt, challenges
- conclusions and recommendations
- appendices

You may not want to report every single aspect of your data as the report needs to be concise enough to be of interest to the target audience. But make sure you do not 'cherry-pick' the data by choosing only positive findings. In many cases we can learn more from what did not work rather than just reporting what was judged to be successful.

Finally, consider sharing your findings by uploading your data to the Public Health England's standard evaluation framework data collection tool.[9] This tool has been developed to assist practitioners to collect standardised summary data from any weight management, diet or physical activity intervention. It will also help us to better understand the types of obesity and related interventions across the country.

Conclusions

This guide is designed to provide a basic introduction to the evaluation of public health programmes. Clearly there are no 'golden rules' and every evaluation has to be tailored carefully to the needs of stakeholders and participants.

No evaluation is perfect and no evaluation answers all questions, however if planned and executed well, evaluations can inform decision making and contribute to improving the public health evidence base.

Evaluation checklist

Aim of project and how it works	✓
What is the purpose of the evaluation?	✓
Who is the intended audience?	✓
Who needs to be involved?	✓
What are the main evaluation questions?	✓
What indicators will you measure?	✓
How you will collect information (method)?	✓
How you will assess the information (analysis)?	✓
Plan for who does what, by when and how, and budget	✓
What ethical issues might there be?	✓
What sort of end product do you want?	✓
What you will do with the results (who are they for, what will you say, what next)?	✓

Further reading

Public Health England, 2012. Standard evaluation framework for weight management interventions
Provides introductory guidance on the principles of evaluation and identifies 'essential' and 'desirable' criteria for data collection in the evaluation of weight management interventions. Available from: www.noo.org.uk/SEF

Public Health England, 2012. Standard evaluation framework for dietary interventions
Provides 'essential' and 'desirable' criteria for data collection in the evaluation of physical activity and diet interventions. Available from:
www.noo.org.uk/core/frameworks/SEF_Diet

Public Health England, 2012. Standard evaluation framework for physical activity interventions
Provides 'essential' and 'desirable' criteria for data collection in the evaluation of physical activity and diet interventions. Available from:
www.noo.org.uk/core/frameworks/SEF_PA

Public Health England, 2011. Evaluation data collection tool
An on-line tool to assist practitioners to collect standardised summary data from weight management, diet and physical activity interventions.
Available from: www.noo.org.uk/core/eval_collection

Better Evaluation http://betterevaluation.org

National Heart Forum, 2008. Tool D14 Monitoring and Evaluation in 'A Framework in 'Healthy Weight Healthy Lives: A Toolkit for Developing Local Strategies'.
Provides a framework for evaluating and monitoring local interventions. It presents a 12-step guide on the key elements of evaluation, an evaluation and monitoring checklist, and a glossary of terms. Available from: www.heartforum.org.uk

Medical Research Council, 2008. Developing and evaluating complex interventions: new guidance.
Provides guidance on the development, evaluation and implementation of complex interventions to improve health. The resource is aimed primarily at the research/academic community – for a more basic introduction to evaluation, users should refer to the NOO standard evaluation framework. Available from:
www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d=MRC004871

National Insitute of Health Research Research Design Service.
www.nihr.ac.uk/research/Pages/ResearchDesignService.aspx

Magenta Book – Guidance for evaluation

www.gov.uk/government/uploads/system/uploads/attachment_data/file/220542/magenta_book_combined.pdf

Public ServiceTransformation: Guide to evaluation

http://mycommunityrights.org.uk/wp-content/uploads/2014/01/EvaluationGuideFinalv2.0.pdf

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3 Viehbeck S, Petticrew M, Cummins S. Old Myths, New Myths: Challenging myths in public health. American Journal of Public Health (in press).

4 Public Health Outcomes Framework. Public Health England www.phoutcomes.info/

5 Haynes L, Service O, Goldacre B, Torgerson D. (2012). Test, Learn, Adapt: Developing Public Policy with Randomised Controlled Trials. The Cabinet Office. www.gov.uk/government/uploads/system/uploads/attachment_data/file/62529/TLA-1906126.pdf

6 Health Research Authority. National Research Ethics Service. www.hra.nhs.uk/about-the-hra/our-committees/nres/

7 Health Research Authority. Defining Research. www.hra.nhs.uk/documents/2013/09/defining-research.pdf

8 The Research ethics guidebook. http://www.ethicsguidebook.ac.uk/Asking-questions-of-participants-100

9 Public Health England data collection tool www.noo.org.uk/core/eval_collection

Reader Information

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