

Using evidence in practice

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Introduction

This briefing summarises the approach NICE takes to assessing what evidence to use as the basis of our public health recommendations.

It provides an introduction to how to use evidence to inform decisions about public health issues ('evidence-informed' decision making). It may also be useful for people working in other local authority departments.

People are persuaded by different types of evidence when making decisions. This varies between sectors – and among professionals within sectors. Health and social care professionals tend to use 'formal' evidence based on research and evaluation. They may also take into account other types of evidence including local views, community preferences, audit, or even the results of toxicological tests.

It is important to match the evidence to the questions you are trying to answer – and also to your audience. This briefing explains some basic concepts and terms and how different types of evidence can be used to inform decisions about commissioning and practice.

For details of how NICE uses evidence, see our [methods and processes for developing NICE guidelines](#).

Key messages

Local authorities are under pressure to make public health decisions that offer value for money and help people in their area keep healthy. Using robust methods to identify and interpret evidence, along with clear and transparent processes, helps local authorities:

- provide effective and cost-effective local services
- reduce health inequalities
- potentially strengthen community engagement by involving stakeholders in decision making
- contribute to an improved evidence base.

These principles are reflected in the Local Government Association's [Money well spent? Assessing the cost effectiveness and return on investment of public health interventions](#) (2013). This says investment in public health should be based on the best available evidence of effectiveness from a range of sources.

In fact this approach doesn't just apply to specific public health decisions: everything local authorities are involved in has a potential effect on people's health. So the principles of evidence-informed practice apply across all services.

The National Institute for Health and Care Excellence (NICE) provides national guidance and advice to improve health and social care.

For further information on how to use this briefing and how it was developed, see [About this briefing](#).

An overview of how NICE uses evidence

Over the years we have developed a process and a set of methods for identifying, synthesising and appraising a range of different types of evidence – because different types of evidence can answer different types of question.

We build in a reasonable amount time, proportionate to the length and complexity of the particular guideline, to gather the best available evidence (see our [methods and processes for developing NICE guidelines](#) and table 1 below).

Table 1 Type of evidence NICE uses to answer specific types of question

	Systematic reviews of effectiveness	Randomised controlled trials (RCTs)	Quasi-experimental studies	Cohort studies	Case-control studies	Non-experimental evaluations	Surveys	Qualitative studies
Effectiveness – does an intervention work better than other interventions or doing nothing at all?	+++	++	+	+				
Process of service delivery – what is the best delivery method?	+++					+	+	++
Salience – is the health problem important enough to warrant action?	+++						++	++
Safety – is there a danger that an intervention could do more harm than good?	+++	++	+	+	+	+		+
Acceptability – will people be willing to use the intervention?	+++	+	+			+	+	++
Cost-effectiveness – is it worth buying the intervention?	+++	++						
Appropriateness – is this the right intervention for the target audience?	++						++	++
Satisfaction – are users, providers and other stakeholders happy with the intervention or service?	+			+	+		++	++

Note: the number of '+' symbols indicates how well a type of study can answer a particular type of question.

Adapted from Gray (1997), and Petticrew & Roberts (2003):

- Table published in *Evidence Based Healthcare*, J.A.M. Gray, 1997, p. 72, Copyright Elsevier.
- Reproduced from *Journal of Epidemiology & Community Health*, M. Petticrew & H. Roberts, "Evidence, hierarchies, and typologies: horses for courses", Vol 57, pp. 527–529, 2003 with permission from BMJ Publishing Group Ltd.

Evidence, hierarchies, and typologies: horses for courses (2003)

The evidence NICE uses comes mainly from:

- quantitative studies (including systematic reviews of effectiveness)
- non-experimental evaluations
- qualitative studies.

Many 'primary' sources of evidence can be used to inform decisions. Primary evidence comes from a single, original piece of research.

Where there is a large amount of primary evidence on a given topic, NICE often uses systematic reviews ('secondary' sources of evidence) to identify, appraise and synthesise it. This involves using clear, structured techniques.

Bringing large numbers of primary studies together in this way – so long as they address similar research questions and are of comparable designs – can produce much stronger evidence. This can be used to help us answer questions about effectiveness, cost effectiveness and other issues.

Systematic reviews can cover quantitative or qualitative evidence, or both. They are a valuable source of evidence because they are based on methodical search methods and have the potential to bring together a significant amount of relevant research.

NICE also uses evidence from expert testimony (lay and professional). In addition, we consult with relevant stakeholders as part of the evidence-gathering process (including, for example, during NICE fieldwork). The output from such consultations are similar to [qualitative evidence](#), but they can also be used to produce [quantitative](#) and evaluation evidence.

NICE's advisory committees make recommendations based on the available evidence. In addition, all our committees are encouraged to take account of equality issues and current national policies. They also take account of (and make explicit) the value judgments they make. See NICE's [Social value judgments: principles for the development of NICE guidance](#). This explicitly acknowledges that non-scientific values are brought to bear when developing guidance. (These also form part of committee deliberations.)

NICE believes that decision makers should make explicit the kinds of interpretive methods they use during the inferential and judgmental process ([The judgement process in evidence-based medicine and health technology assessment](#) Kelly and Moore 2012).

Our manual on the [methods and processes for developing NICE guidelines](#) outlines how important it is to ensure the cause-and-effect relationships in a study are true for the people and conditions of the study. (This is a measure of how well it has been designed.) It also provides guidance on how to assess study quality.

In addition, the Canadian National Collaborating Centre for Methods and Tools has published a useful [factsheet on evidence-informed decision-making in public health](#) (2012).

What other evidence can local authorities use and when?

Local needs assessments

Carry out a local assessment before developing or commissioning interventions and services. (See [Principles for planning](#) in our behaviour change pathway.)

A needs assessment may have already been done as part of the local joint strategic needs assessment. Usually this would produce numeric (quantitative) data, but it might also include qualitative evidence. Local assessments should include:

- demographic information on the people affected by a particular issue
- the nature of the issue and who is particularly at risk
- the local community's strengths, level of community engagement and cohesion, and other resources that could help reduce or prevent the problem
- services that could be commissioned locally
- the social and environmental context.

Possible information sources include:

- Public Health England, in particular, the organisation's [Longer lives](#) website and [Child and Maternal Health Intelligence Network database](#)
- local [Hospital Episode statistics data](#) (using freely available 'Standard publications' extracts to get a breakdown of 'provider level', 'CCG' (clinical commissioning group), or 'hospital providers' data
- data from accident and emergency departments, GP practices and the census
- local indices of deprivation
- local transport statistics
- local council housing records.

Match interventions and services to needs

Interventions should be based on the results of the local needs assessment and the best available evidence, taking into account advice on how to interpret that evidence.

If there is evidence that an intervention doesn't work or isn't applicable for a setting or population (see [Principles for selecting interventions and programmes aimed at populations](#) in the NICE behaviour change pathway), it should not be commissioned or implemented. Equally, if routine monitoring data or an evaluation shows that a service or intervention is not meeting its goals – despite being implemented in the way it was intended – then disinvestment should be considered.

Finally, if a service or intervention achieves its goals – for example, an intensive immunisation campaign achieves its target on coverage – it may be an opportunity to switch to something that is less intensive.

Take context into account

Services or interventions should take into account local circumstances, community activities, existing area-based initiatives and past experiences. (See [Develop national, regional and local policy](#) in our community engagement pathway.)

Any national interventions and programmes should also be taken into account (assuming they are based on the best available evidence).

Collect evidence, evaluate and share experience

Sometimes, the evidence for an intervention may be mixed. When this happens, it is a good idea to commission an intervention alongside a rigorous evaluation or research exercise, possibly as a pilot. This is something that we often advocate in our guidance, including our recommendations on behaviour change (see [Principles for planning](#) in our behaviour change pathway).

Our guidance on behaviour change also recommends that, if necessary, funding applications and project plans for new interventions should include specific provision for data collection and evaluation. (See [Evaluation principles](#) in our behaviour change pathway.)

If possible, the intervention should also include a range of indicators that help to evaluate not only what works, but in what context, as well as the costs and the experiences of those involved.

Interventions that do include provision for evaluation should be prioritised, especially if they adopt a new approach.

When an evaluation is completed, it can be submitted for possible inclusion in NICE's [local practice collection](#) (see below). Alternatively, try to publish it in the wider research literature.

What to do when the 'formal' evidence is poor or missing

Public health commissioners and decision makers may find that there is a lack of evidence – or a lack of good quality evidence – to support proposed areas of work. This doesn't necessarily mean that no decision can be made or that no service can be commissioned.

First of all, make sure all possible evidence has been accounted for – not just the 'formal' research and evaluation evidence described earlier.

For example, find out if similar services are being run elsewhere (even if it's for a different target group or run in a slightly different way – or it's providing a different service altogether but using similar delivery mechanisms).

Also talk to experts on the topic to get their views and consult with local stakeholders. As part of these discussions, they may well be able to point you to other similar local authority areas where the service in question is provided.

Finally, '[triangulate](#)' all the available evidence. In other words, put the findings from different sources together to see if it is worth adopting the new approach or service.

If you are still uncertain about a proposed service or activity, then commission a pilot scheme and monitor and evaluate the results over a reasonable period of time, for example, a year. (See NICE's local government briefing on [Behaviour change](#).)

Above all, make it clear what type of evidence has been used to inform a decision and why. This will aid transparency and help stakeholders understand how decisions have been reached.

Types of evidence NICE uses to answer specific types of question

The following sections describe each type of evidence outlined in [table 1](#).

Quantitative studies

Quantitative evidence uses numeric methods to systematically develop models and theories about what improves health or causes ill-health in a given population.

The trustworthiness (or [validity](#)) of quantitative evidence is assessed by asking the following questions:

- Have potential sources of bias been minimised? (This determines internal validity.)
- Are the findings open to any degree of doubt? (This determines internal validity.)
- Are the findings applicable to the whole target population? (This determines external validity.)

Different types of quantitative evidence are described below.

Systematic reviews of effectiveness

Systematic reviews of effectiveness answer specific questions, for example, about the effectiveness of a particular intervention, or what aspects contribute most to its success. (This might relate, for example, to the setting or mode of delivery.) The types of studies included in the review depend on the question being asked.

Studies are identified using systematic search criteria. If possible, a '[meta-analysis](#)' of eligible studies may be undertaken. This is a statistical procedure that attempts to measure the overall effect of an intervention.

The studies usually include randomised controlled trials, but other types of study designs are sometimes included, for example, observational and experimental studies.

Surveys

Surveys can be used with a group or community to determine the level of satisfaction with particular activities and services. They can also be used to:

- gather information about the prevalence of a health problem, its perceived seriousness and views about the best ways to resolve the problem
- determine people's attitudes on a particular issue to inform public policy (for example, at a national level, the [British Social Attitudes survey](#))
- gather information on health and health-related behaviour (for example, at a national level, the [Health Survey for England](#)).

'Cross-sectional' surveys comprise a questionnaire or interview with a sample group at only 1 point in time. 'Longitudinal' surveys are used to repeatedly collect information from the same people over time.

Observational studies (including case–control and cohort studies)

Observational studies tell us about the benefits and risks of providing a service or intervention for the general population. They include case-control and cohort studies.

In these types of study, a group or 'cohort' of people are observed to see who develops the outcome of interest. For example, such a study could examine the question of whether childhood obesity predicted adult weight.

In a case–control study, a group of people who have the same condition or problem are compared with another group who do not have the condition (the control group) to try and determine what causes it. For example, the lifestyles, general living conditions and employment status of a group of people who are obese might be compared with a group of people who are a healthy weight.

The studies can be 'cross-sectional' – information is collected once for a range of different groups, or 'longitudinal' – information is collected over a period of time. The results might be used to design more informative community trials.

Experimental studies (including RCTs and quasi-experimental studies)

Experimental studies test the effectiveness of a service or intervention by deliberately assigning people to different groups.

The best quality study of this type is a randomised controlled trial (RCT). One group (the experimental group) receives the advice or support being tested. The other (comparison or control group) receives an alternative, a dummy intervention (placebo) or no intervention at all.

The groups are followed up to see how effective the advice or support was. Outcomes are measured and any difference in response between groups is assessed statistically.

Non-experimental evaluations

Non-experimental evaluations aim is to assess the usefulness of, or how to implement, an intervention against a given set of standards. They also help determine what improvements may be needed.

These evaluations are useful if it's not possible to gather evidence from a piece of controlled quantitative research. The evaluation may use a combination of quantitative and qualitative methods.

Qualitative studies

Qualitative studies explore the beliefs, experiences, attitudes, behaviour and interactions of people (this includes target populations and practitioners) using techniques such as focus groups and in-depth interviews.

The resulting local 'stories' or 'narratives' may provide a different perspective from published evidence and research, and this may prove useful to decision makers.

This type of evidence can be assessed using the same broad concepts of validity used for quantitative data, taking the aims of the particular piece of research into account.

In addition to the qualitative checklists provided in the NICE manual on the [methods and processes for developing NICE guidelines](#), the [Magenta book](#) (HM Treasury 2011) offers a framework for assessing qualitative evidence.

Equality issues

Income, employment, education and environment can all lead to inequalities in health between individuals or groups (see figures 1 and 2) and different types of evidence can be used to help reduce these inequalities. It's worth remembering that:

- when carrying out a needs assessment, people with the most needs are often the least likely to be heard
- the approaches used to collect local statistics can help demonstrate the effect of health inequalities on different groups
- data gathered on the factors causing health inequalities can be used to decide on the best approach to tackling them.

The measures used to describe or tackle general inequalities sometimes refer to a 'social gradient' (see figure 1). In a health context we talk about a 'health gradient' because poorer people are, on average, less healthy than people who are better off.

If the evidence shows that, for example, the number of instances of cardiovascular disease in a given area is higher than average, or people in a particular group describe their health as poor, then a targeted approach may be needed. The aim is to ensure a faster rate of improvement among the worst affected groups to reduce the health gradient (see figure 2).

Figure 1 The baseline health gradient

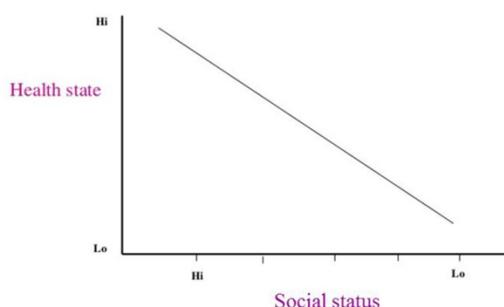
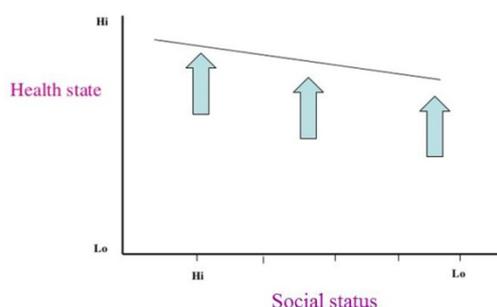


Figure 2 Shifting the health gradient through universal and targeted action



Source: [NICE and Public Health England: providing the evidence base for better public health outcomes](#) NICE 2011.

The British Academy's ['If you could do one thing': nine local actions to reduce health inequalities](#) (2014) outlines what local authorities could do to improve people's health and reduce health inequalities. The NESTA [Creative Councils programme](#) also covers some relevant approaches.

Sources for evidence-informed decisions

Searching through published research and interpreting the findings takes time, resources and expertise. In addition to NICE, the following provide guidance and evidence summaries that can help local authorities choose appropriate interventions or programmes:

- [NHS Evidence](#)
- [Cochrane Reviews](#) and [the Cochrane Library](#)
- Centre for Reviews and Dissemination's [Database of Abstracts of Reviews of Effectiveness and NHS Economic Evaluation Database](#)
- [The National Institute for Health Research School for Public Health Research \(NIHR SPHR\)](#)
- The [What Works Network](#), a government initiative to improve the use of high quality evidence for decision-making.

Evidence-informed decision making: case studies

Below are 2 examples of how different sources of evidence have been used by local authorities to support their decision making processes.

Case study 1: Gateshead Borough Council

[Gateshead Borough Council](#) audited the extent to which evidence-based practice was used to plan and deliver work. (This case study was submitted to NICE in 2010/11 as part of a 'shared learning' initiative.)

Five pieces of NICE guidance were used as the basis for the audit in specific directorates: [Behaviour change: the principles for effective interventions](#), [Community engagement](#), [Physical activity and the environment](#), [Promoting physical activity in the workplace](#) and [Workplace interventions to promote smoking cessation](#).

The main focus was the behaviour change guidance.

NICE's audit tools for the behaviour change guidance were modified for the exercise and a multidisciplinary workshop was organised. During the workshop, the behaviour change recommendations were mapped to the council's health strategy, to highlight how they should be applied.

Lessons learnt

- Corporate sponsorship at director level is essential for public health initiatives and key stakeholders are needed to drive the work forward.
- Tailored audit tools that are jargon-free and specific to local authorities are needed.
- Training on evaluation is needed to ensure both quantitative and qualitative data are used to determine whether initiatives are effective.

Case study 2: Implementing 20 mph speed limits or zones

Our guidance on [Preventing unintentional road injuries among under-15s – road design](#) (NICE public health guidance 31) recommends introducing 20 mph speed limits and zones. For further information, see NICE's [Key facts for local councillors – making the case for investment tool](#).

Bristol City Council

Bristol City Council decided to design, refine and implement a 20 mph scheme based on its initial pilot scheme. The types of evidence used included:

- National guidance from the Department of Transport and analysis of casualty data (this was used to help develop the pilot scheme).
- NICE guidance on [physical activity and the environment](#) (NICE public health guidance 8).

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- Data from local projects on the benefits of physical activity.
 - The results of the pilot scheme, including public opinion surveys and a study on the effect the changes had on other transport services and pedestrians.
 - Findings of commissioned research included:
 - an evidence review of published and grey literature on attitudes and behaviour towards 20 mph limits and effective 'soft' measures to influence speed choice
 - qualitative research on local residents' views and attitudes
 - a review of schemes run by other local authorities.

London Borough of Haringey

The London Borough of Haringey considered the following types of evidence when deciding whether a 20 mph speed limit could be adopted across the borough:

- Research and national guidance from the Department for Transport.
- Interviews with key stakeholders and local residents' organisations.
- Evidence on effectiveness from local authorities that had already implemented default 20 mph speed limits.
- Data collated by Transport for London and the Mayor of London.
- Financial data, including the comparative costs of specific schemes.

At the time of publication, Haringey had just consulted on this scheme.

Other examples of good practice

Other examples of how NICE's advice has been used to collect more evidence (including through evaluations) can be found in our [local practice collection](#). These include:

- [Improving services by focusing on what works: developing learning in a local authority](#).

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- [An audit of the implementation of NICE public health guidance on promoting physical activity for children and young people.](#)
 - [Using NICE guidance and quality standards to drive sector-led improvement in Greater Manchester.](#)

About this briefing

This briefing is a summary of how NICE uses evidence to make its public health recommendations. It was written with advice from NICE's Local Government Reference Group and using feedback from local authority officers, councillors and directors of public health.

It is for local authority officers, elected members and their partner organisations in the health and voluntary sectors, in particular, those involved with health and wellbeing boards. This includes directors of public health and commissioners and directors of adult social care and children's services. It will also be relevant to local authority scrutiny activities.

This briefing may be used alongside the local joint strategic needs assessment to review or update the joint health and wellbeing strategy.

This briefing is intended to be used online and it includes hyperlinks to sources of data and further information.

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