

How NICE measures value for money in relation to public health interventions

Local government briefing

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Introduction

This document summarises the approach NICE takes to assessing the cost effectiveness of public health interventions. It describes some of the basic concepts and terms and is a companion to the local government briefing on judging whether public health interventions offer value for money.

For full details of NICE's approach to assessing the cost effectiveness of public health interventions see [Chapter 6](#) of 'Methods for the development of NICE public health guidance' (third edition).

Why assess cost-effectiveness?

NICE does not accept or reject interventions on cost-effectiveness grounds alone, but assessing cost effectiveness is an integral part of the way we develop guidance.

We assess 3 issues in relation to cost effectiveness:

- Is a service or intervention effective (that is, does it achieve what it sets out to achieve)?
- Is it more effective than the alternatives and, if so, by how much?
- How much does it cost compared with the next best alternative?

An intervention is said to be 'cost effective' if it leads to better health than would otherwise be achieved by using the resources in other ways. In other words, an effective intervention may not, necessarily, be cost effective.

The overall aim of cost-effectiveness analysis is to help decision makers choose interventions and programmes that maximise the health benefits, given the resources available – and ensure waste is minimised (that is, to be efficient). However, it is also important to ensure a fair distribution of benefits across the population (that is, to adopt an equitable approach).

Thus, a balance must also be struck between ensuring resources are allocated efficiently, on the one hand, and an equitable allocation of those resources, on the other.

NICE's approach to economic analysis for public health interventions

Introduction

Up to 2012, based on [Methods for the development of NICE public health guidance \(2nd edition\)](#), cost–utility analysis was NICE's main method of determining the cost effectiveness of public health interventions.

Drawing on experience gained from producing public health guidance, the latest edition (3rd edition) of 'Methods for the development of NICE public health guidance', published in 2012, places more emphasis on cost–consequences and cost–benefit analyses when assessing public health interventions (see [Chapter 6](#)).

This dual approach aims to ensure all relevant benefits (health, non-health and community benefits) are taken into account. The idea is to help local authorities (and other organisations interested in improving people's health) better judge whether or not a public health intervention represents value for money.

Cost–utility analysis is also used, when needed, to make comparisons with previous economic analyses, as well as to compare treatment and prevention programmes.

Cost–utility analysis

Cost–utility analysis considers people's quality of life and the length of life they will gain as a result of an intervention. The health benefits are expressed as [quality-adjusted life years \(QALYs\)](#).

Generally, we consider that interventions costing the NHS less than £20,000 per QALY gained are cost effective. Those costing between £20,000 and £30,000 per QALY gained may also be deemed cost effective, if certain conditions are satisfied (see [section 6.4.1](#) of 'Methods for the development of NICE public health guidance' 3rd edition).

There may be other significant benefits that are not captured by the QALY. Where this is the case, the analysis may not provide a good measure of value for money and would not be used as the sole basis for decisions.

Cost-consequences analysis

Cost-consequences analysis considers all the **health and non-health benefits** of an intervention across different sectors and reports them in a disaggregated form. It accepts that different types of benefit cannot be gauged using the same units.

The following costs can be included:

- direct costs, including for health care, social services and transportation
- indirect costs, including productivity losses and for criminal justice expenditure
- intangible costs, including those related to quality-of-life and the impact of living with pain.

All impacts and costs are considered (even if the impacts cannot be costed) when deciding which interventions represent the best value. This distinguishes it from cost-benefit analysis.

Effectively, this type of analysis provides a 'balance sheet' of outcomes that decision makers can weigh up against the costs of an intervention.

If, for example, a commissioner wants to ensure the maximum health gain for the whole population, they might prioritise the cost per QALY gained. But if reducing health inequalities is the priority, they might focus on interventions that work best for the most disadvantaged groups, even if they are more costly and could reduce the health gain achieved in the population as a whole.

Cost-benefit analysis

Cost-benefit analysis considers **health and non-health benefits** but converts them into a single monetary value, rather than reporting each individually. Once this has been done, 'decision rules'

are used to decide which interventions to undertake. Several metrics are available for reporting cost-benefit analysis results. One example is the net present value (NPV).

NPV is found by estimating all the annual benefits of an intervention in monetary terms, but successively discounting the benefits after year 1, and then summing the result over all the years included in the calculation. This yields what is called the 'present benefit'.

The same calculation is performed on the estimated costs each year to get the 'present cost'. The net present value is calculated by subtracting the present cost from the present benefit. Generally, only interventions with a positive net present value would be considered for adoption.

There may be other significant costs and benefits, some of which cannot be presented in terms of money. Where this is the case, the analysis may not provide a good measure of value for money and would not be used as the sole basis for decisions.

Important methodological issues to bear in mind

Perspective

The range of costs (and benefits) included in a particular economic evaluation depends on the perspective taken. Judgements can be made from a range of perspectives including: the individual, healthcare provider, criminal justice, public sector or society.

The perspective adopted can influence the results. For example, an intervention costing more than 'treatment as usual' when a community health service perspective was taken, was found to be cost saving using a criminal justice perspective (Byford et al. 2003^[1], Drummond et al. 2008^[2]).

As the costs and benefits of public health interventions can impact on a range of different organisations within the public sector, a public sector perspective is usually adopted. Where necessary, a broader 'societal' perspective is adopted, to ensure all relevant costs are included, regardless of who pays for them.

Discounting

Economic analyses should take into account the effect of the passage of time by using discounting, as costs and benefits incurred today are usually valued more highly than any similar costs and benefits occurring in the future. Discounting allows us to make meaningful comparisons of costs and benefits over time.

For example, using an annual discount rate of 3% would mean that a year of life gained in 40 years time (due to an intervention delivered today) will be worth less than 3 months, compared with a year gained tomorrow.

Thus, interventions that incur costs now, but only provide benefits years later, look less cost effective under discounting than interventions that lead to immediate benefits. In these cases it might be appropriate to use a lower discount rate.

Local authorities

No standard method has yet been devised to apportion costs – and who should bear them – when more than 1 government department (or, indeed, local authority) is involved. This may prove particularly difficult when 1 national or local authority department secures the benefits of a public health intervention, but another is required to fund it.

Community and political preferences and constraints will also have an important bearing on the decision making process. In addition, different valuation methods and different perspectives can lead to different judgements of the same intervention in terms of value for money (see [Case study](#)).

NICE does not recommend any particular method for dealing with such issues. Rather, we recommend that the method chosen, the criteria used and the method of prioritisation used to support decision making should be clearly justified and transparent.

^[1] Byford S, Knapp M, Greenshields J et al. (2003) Cost-effectiveness of brief cognitive behaviour therapy versus treatment as usual in recurrent deliberate self-harm: a rational decision making approach. *Psychological Medicine* 33: 977–86

^[2] Drummond M, Weatherly H, Ferguson B (2008) Economic evaluation of health interventions: A broader perspective should include costs and benefits for all stakeholders. *British Medical Journal* 337: 1204

Case study

NICE undertook 2 analyses of an intervention to prevent unintentional injuries on the road, first using cost–utility analysis (its main method) and then using cost–benefit analysis (the approach used by the Department for Transport [DfT]).

The cost-utility analysis was from the public sector perspective. It took into account all quality-adjusted life years (QALYs) and medical, police, local authority and DfT costs (paid or saved) due to the intervention.

The cost-benefit analysis was from a broader societal perspective and took a wide range of costs and benefits into account. This included the medical costs saved. It also included any 'human' costs saved (such as the grief of people who are bereaved) and savings from avoiding other non-health impacts (for example, a reduction in the capacity to work).

NICE's more traditional analysis estimated a cost-per-QALY gained of £89,700. This would not be considered cost effective for the NHS using NICE's threshold for the service of £20,000 to £30,000. The cost-benefit analysis led to a net present value of £90,625. As noted in the definition of cost-benefit analysis above, interventions with a positive net value would generally be considered cost effective.

For further details see the [Preventing unintentional road injuries among under 15s: road design: Cost effectiveness modelling report](#) for NICE public health guidance 31.

Return on investment versus cost effectiveness

Financial savings

In a time of budget constraints, people want to see 'real' financial savings (that is, reductions in budgetary expenditure) by asking, 'do the economic benefits of a public health intervention to tackle X outweigh the economic costs?'

But viewing initiatives simply in terms of a return on investment (without taking account of the gains to society), could mean that very large health and wellbeing gains may be disregarded because they fail to save money – or fail to save enough. Arguably, based on this approach, many valuable local government activities (such as libraries and museums, environmental and leisure services or parks and gardens) would be abandoned.

Placing a monetary value on the health and other gains achieved overcomes this problem, by assuming that a certain benefit or outcome is desired – and that there are several alternative ways to achieve it. The basic question asked is, 'which of these alternatives is the cheapest or most efficient way to get this benefit?' In other words, which alternative is the most cost effective?

Timing of costs and benefits

One further element to consider is the timeframe used as the basis for analysis. It may take several years before the health benefits of some public health interventions start to have an impact, although the costs would be incurred immediately.

Such interventions may be cost effective or even cost saving over the medium to long term and so would be recommended for funding using the cost effectiveness approach. However, in a simple return on investment analysis (cost savings minus cost of intervention), they may not be deemed to be value for money in the short term.

The implications of both timing and the method of analysis are illustrated in the example below.

Brief GP intervention to prevent problem drinking

Suppose that a GP sees someone with a drink problem at 2 separate, 15-minute appointments, a month apart. During each appointment they discuss the behaviour and agree how the person can try and reduce the amount they drink.

Suppose that the GP also gives advice on the adverse effects of alcohol and provides a prescription and 'drinking diary' cards and the person receives a follow-up call from a clinic nurse 2 weeks after each meeting.

Figure 2 shows the results of an economic analysis which reported both the cost per QALY gained and net present value over a lifetime horizon. The former, a measure of cost effectiveness, provides a ratio of the extra cost required to achieve a unit of extra gain (measured in QALYs). The latter, a measure of return on investment, provides the total costs minus the total value of the benefits.

In the first 10 years following the intervention, the net present value is negative which means the costs outweigh the benefits. So if the funding decision was based on this metric – and within this timeframe – it is unlikely that the intervention would be considered. Yet the cost per QALY gained falls well below the current NICE threshold for the NHS and is cost saving after 10 years.

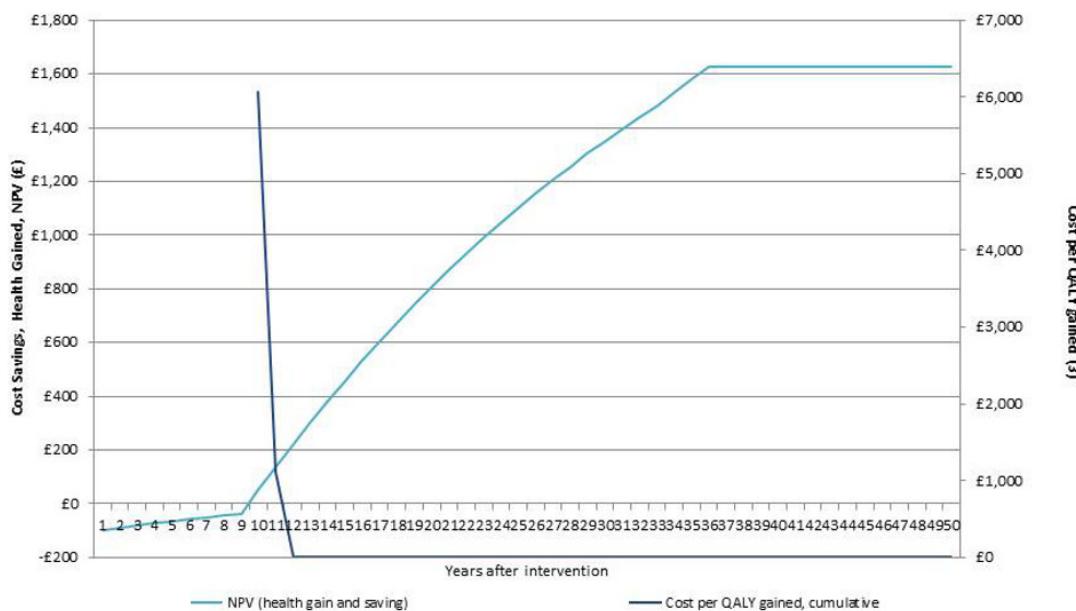


Figure 2: GP-based brief intervention to prevent problem drinking – using 2 approaches to cost-effectiveness analysis: cost per quality-adjusted life year (health benefits) and net present value (health and non-health benefits)

About this document

This document is a summary of NICE's approach to assessing the cost effectiveness of public health interventions. It was informed by feedback from NICE's Local Government Reference Group and from council officers, councillors and directors of public health. It is intended to provide readers with a basic understanding of key concepts and terms relevant to health economic assessment.

For a summary of the benefits of public health interventions see [Funding public health protects our communities and children, saves lives... and can save money](#).

For further information see NICE's local government briefing on [judging whether public health interventions offer value for money](#).

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