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a COVID-19 briefing



# FALSE ECONOMIES

Myths about public health spending

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## Summary

- The coronavirus outbreak in Britain has raised questions about the use of public health resources and about the costs and benefits of the 'lockdown'. It has been argued that the government's response to the epidemic was weakened by cuts to the public health budget. It is widely believed that spending on public health saves money in the long term by reducing future healthcare costs.
- In 2018/19, Public Health England had a budget of £4 billion, of which £3.13 billion was given to local authorities as ring-fenced grants. Like-for-like public health spending by local authorities fell by 17 per cent between 2014/15 and 2018/19, but this has little bearing on the government's response to COVID-19 because the responsibility for dealing with such epidemics lies with Public Health England and the NHS.
- There has been no cut in Public Health England's budget for infectious disease prevention. On the contrary, between 2014/15 and 2018/19, PHE's budget for 'protection from infectious diseases' rose from £52 million to £86.9 million.
- Cutting the public health budget has been described as a 'false economy', with a study published in 2017 claiming that 'most public health interventions are substantially cost saving'. The study reported that public health measures, on average, produce a return on investment of 14.3 ('implying a cash return of 1430%'). This is a misrepresentation. Most public health interventions are cost-effective if a quality-adjusted year of life is valued at £20,000, but less than 20 per cent of interventions save money or produce a cash return.
- More than a third of public health interventions would not be approved if they were NHS treatments because they are not cost-effective. Moreover, public health interventions provided by local authorities are less cost-effective, on average, than conventional healthcare.

- If public health authorities are rational and led by the evidence, they will spend money on the most cost-effective interventions in the first instance and see diminishing marginal returns as spending is extended to less cost-effective measures. A point must eventually be reached when it becomes more efficient to spend on conventional healthcare.
- Claims about cost-effectiveness are more tenuous when interventions deprive individuals of intangible benefits. If people understand the health risks of pleasurable activities, such as drinking and smoking, they will price in the intangible costs of poorer health. If the state uses coercion to make them abandon such activities, they will lose thousands of pounds' worth of intangible benefits. Quantifying the social value of pleasure is as legitimate as calculating the social value of a life year, but only the latter is included in most public health cost-benefit analyses. If lost benefits were included, the overall cost-effectiveness of public health spending would be reduced.
- It is not possible to tell from the available data whether England's public health budget is too small, too large or about right, but many of the arguments made for increased spending on public health are based on a misunderstanding of economics.

# Introduction

The coronavirus pandemic has raised urgent questions about Britain's public health system. The government has been criticised for failing to provide adequate diagnostic testing kits and personal protection equipment. Some have claimed that the UK's response to the epidemic has been weakened by cuts to the public health budget (e.g. Hamilton 2020; Scally 2020). Others have argued for and against the 'lockdown' on economic grounds (Young 2020; Bowman 2020).

With the benefit of hindsight - and arguably without it - it seems obvious that health agencies should have spent more money stockpiling surgical face masks and other personal protection equipment, but this does not necessarily imply that public health budgets have been too small. As this paper will show, public health agencies - as opposed to healthcare providers - are not responsible for procuring such equipment and, in any case, their budget for tackling infectious diseases has risen in recent years.

It remains to be seen whether shutting down a large part of economy to tackle COVID-19 was too little, too late or excessive and premature. As I write this in early April 2020, we do not know enough about the virus, nor about the eventual cost of the response, to produce a reliable cost-benefit analysis. For that reason, it seems wise to err on the side of caution, but it should not be considered macabre or distasteful to ask the question of whether the costs outweigh the benefits. As we shall see, health agencies ask this question all the time.

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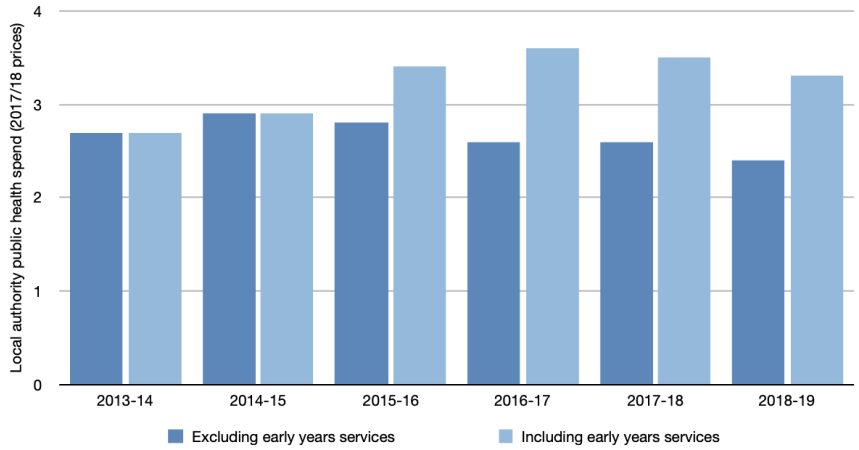
## England's public health budget

Under plans laid out in the 2010 White Paper *Healthy Lives, Healthy People*, the coalition government transferred public health responsibilities in England from the NHS to local authorities. By law, each of the 55 unitary authorities must have a Director of Public Health who is accountable for delivering public health objectives. This change came alongside the creation of a central agency, Public Health England, which became operational in April 2013 with a budget of £3.5 billion, of which £2.7 billion was distributed to local authorities as ring-fenced public health grants. From the outset, PHE said that its 'primary duty is to protect the public from infectious diseases and other environmental hazards and on this we remain at all times alert and ready' (PHE 2014: 57).

By 2018/19, Public Health England had an budget of £4 billion. Of this, £3.13 billion was handed to local authorities in grants. With local authorities in Greater Manchester receiving an additional £208 million from business rates to spend on public health, this implies a total public health budget for England of £4.2 billion. Although this is not an inconsiderable sum, it is an underestimate of government spending on preventive healthcare. Figures are not available for England alone, but data from the Office for National Statistics for the UK show that, of the government's £155.6 billion healthcare budget in 2017, five per cent (nearly £8 billion) was spent on preventive care (ONS 2019).

The public health budget spent by local authorities is shown in Figure 1 (from Finch et al. 2018). In 2015/16, they were given additional funding and responsibilities for early years services (children aged up to five). Adjusted for inflation, like-for-like public health spending by local authorities fell from a peak of £2.9 billion in 2014/15 to £2.4 billion in 2018/19, a cut of 17 per cent. With the early years budget included, overall spending fell from £3.4 billion in 2015/16 to £3.3 billion in 2018/19, a cut of three per cent.

**Figure 1: Public health budget for local authorities in England  
2013/14 to 2018/19**





## Coronavirus and public health spending

Cuts to local authorities' public health budgets have little bearing on the government's response to COVID-19. The responsibility for dealing with such epidemics lies with Public Health England and the NHS, not with local public health directors. There has been no cut in PHE's budget for infectious disease prevention. On the contrary, between 2014/15 and 2018/19, PHE's budget for 'protection from infectious diseases' rose from £52 million to £86.9 million (see Table 1). The agency also spent £2.6 million on global health in 2018/19, which includes 'protecting the UK from emerging international threats' (PHE 2019: 14).

**Table 1: Public Health England's budget for 'protection from infectious diseases'**

<b>2014/15</b>	<b>£52.0 million</b>
<b>2015/16</b>	<b>£67.2 million</b>
<b>2016/17</b>	<b>£81.9 million</b>
<b>2017/18</b>	<b>£80.0 million</b>
<b>2018/19</b>	<b>£86.9 million</b>

The largest part of PHE's budget, aside from the local authority grants, is 'vaccines and counter-measures'. This amounted to £424.6 million in 2018/19 and includes spending on standard vaccinations for seasonal flu, tuberculosis, measles, etc. as well as central stockpiling of emergency vaccines which are periodically discarded as they reach the end of their shelf life. This is important work, but it has been no use against COVID-19 because there is no vaccine for it yet.

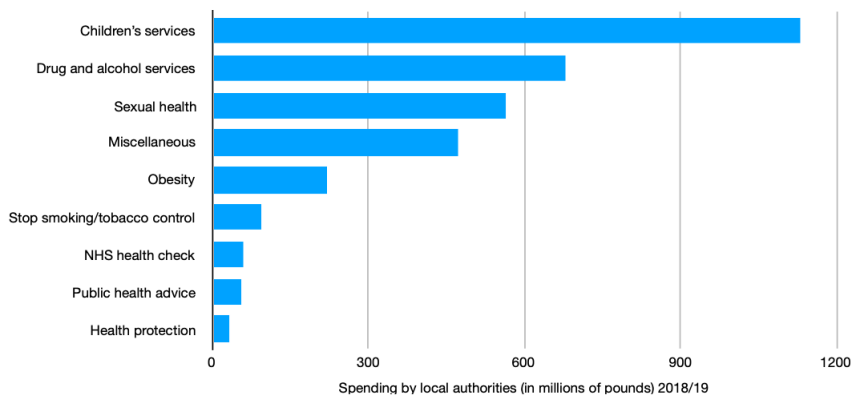
The main complaint about the government's response to the coronavirus epidemic has been the lack of personal protection equipment (PPE), such as face masks and hazmat suits, and the shortage of ventilators and diagnostic testing kits. Public Health England has been criticised for its failure to facilitate enough COVID-19 testing (Lesh 2020), but the agency is only partially responsible for providing testing equipment and not at all responsible for stockpiling PPE or ventilators. It may offer advice, but procurement is the job of the Department of Health.

It could be argued that an agency whose 'primary duty is to protect the public from infectious diseases' should be directly responsible for the provision of PPE, but that is a conversation for another day. The important point is that Public Health England's budget for dealing with infectious diseases has risen in recent years and neither PHE nor local public health directors are responsible for the bulk of frontline work on coronavirus.

## Local public health spending

If you include routine vaccination programmes, 13 per cent of the public health budget is spent on protecting the public from infectious diseases. Most of the rest goes to local authorities who spend it as shown in Figure 2 (based on Finch et al. 2018: 5).

**Figure 2: Public health grant expenditure 2018/19**



According to the Health Foundation, all but one of these areas of spending has seen cuts since 2014/15, from a six per cent cut for 'miscellaneous' to a 32 per cent cut for stop smoking/tobacco control (ibid.).<sup>1</sup> Only childhood obesity has seen a rise in spending.

<sup>1</sup> Finch et al. (2018: 5) say that the miscellaneous category 'usually includes staff, which partly represents the time and resources public health teams can allocate to influencing other areas of local authority policy.'

These cuts have caused some consternation, with many describing them as a ‘false economy’. This was the phrase used repeatedly in a 2016 report from the House of Commons Health Committee (2016: 3) which concluded that:

‘Cuts to public health and the services they deliver are a false economy as they not only add to the future costs of health and social care but risk widening health inequalities’.

Similarly, a House of Lords Select Committee (2017: 81) reported that ‘Significant cuts to public health budgets struck us as a false economy.’

The King’s Fund think tank went further, describing the cuts as ‘the falsest of false economies’ (Buck 2015). Although the public health grant to local authorities rose to £3.3 billion in 2020/21, the King’s Fund preempted the funding announcement, saying (Buck 2020: 38):

Whatever the funding outcome for 2020/21, it will not be enough. The Health Foundation and The King’s Fund have jointly stated that the grant, which currently amounts to £3.1 billion a year, is now £850 million lower in real-terms than [its peak] in 2015/16. With population growth factored in, £1 billion will be needed to restore funding to 2015/16 levels.

Although it is the government that made these cuts, the Department of Health’s 2019 Green Paper, ‘Advancing our health: prevention in the 2020s’, appears to accept the logic behind the ‘false economy’ claim, saying:

Prevention is common sense. We also know it represents extremely good value for money. A recent systematic review found that for every £1 spent on public health interventions, there was an average £14 of benefit to wider society. This includes healthcare savings, but also the longer-term gains in health and to wider society.

The claim that public health spending produces a 14 to 1 return on investment has been widely shared and is widely misunderstood. The government’s explanation of it above is broadly correct, but it can be easily mistaken for a financial saving of £14 for every £1 spent. It is not, and it is important to distinguish the ‘benefit to wider society’ from the financial return on investment.

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## Return on investment

In business, a return on investment (ROI) is the ratio between net profit and financial outlay. This can be shown as a ratio or as a percentage. For example, if £1,000 is invested in a business and that share of the business is later sold for £2,000, the ROI is 100 per cent or 2:1.

State-funded health interventions are not designed to make a profit and so, in the context of public health, the ROI can mean one of two things. It can refer to money saved by preventing future healthcare costs, or it can mean intangible health benefits expressed in monetary terms.

The 14:1 statistic mentioned above comes from a study by Masters et al. published in the *Journal of Epidemiology & Community Health* in 2017 which was press released with the headline: 'Every £1 spent on public health in UK saves average of £14' (BMJ 2017). This is misleading because it implies a direct saving to taxpayers through the prevention of future healthcare costs, but that is not what the study looked at. Instead, it reviewed 52 pieces of research from around the world, covering a range of public health interventions, and concluded that, on average, they produced an ROI to 'the wider health and social care economy' equivalent to £14 for every £1 spent (Masters et al. 2017). This is neither a cash sum nor a saving. The bulk of it comes from putting a monetary value on a year of life and multiplying it by the number of life years expected to be saved by the interventions.

Years of life clearly have value and there is nothing wrong with framing them in financial terms for the purpose of economic analysis. The health budget is limited and it makes sense to get the biggest bang for our bucks, but the benefits that come from better health are largely intangible and are principally bestowed on individuals. For the most part, the 'social value' created does not yield a financial return on investment.

By way of analogy, a local council might decide to erect a statue to a revered character at a cost of £10,000. An economist could estimate its social value by finding out how much the residents are prepared to pay to keep the statue. If a thousand residents are prepared to pay £20 each, the social value of the statue is £20,000. This shows us that the statue has value, but it would be an obvious mistake to claim that the statue has boosted the local economy by £20,000 or has saved taxpayers £10,000.

The academics who came up with the 14:1 claim make a similar mistake when they say, 'First, even with the most rudimentary economic evaluations, it was clear that most public health interventions are substantially cost saving...' (ibid.: 831).

This is not true. The study looks at cost-effectiveness, not cost savings.

The authors make a further mistake by drawing a direct parallel with business investment, saying that at an 'ROI of 14.3 implying a cash return of 1430% would sound too good to be true in the financial world' (ibid.). Indeed it would, but the ROI estimates do not represent a financial profit, nor is the return on investment a 'cash return'.

They conclude that "the UK government's "efficiency savings" thus represent a false economy which will generate many billions of additional future costs to the ailing NHS and wider UK economy' (ibid.: 832).

This is not supported by the studies in their review and, for reasons we shall come to shortly, is unlikely to be true.

If academic researchers are unable to distinguish between cost savings and cost effectiveness, what hope is there for journalists and lay people? David Buck of the King's Fund notes that the 'increasingly common misunderstanding and misuse of the term "return on investment" and its conflation with "cost saving" to public services – usually the NHS – are a cause for concern' (Buck 2018).

The World Health Organization (WHO) is equally guilty of using misleading terminology. The title of its 2018 publication *Saving Lives, Spending Less* implies that expenditure on public health more than pays for itself. This message is made explicit in the text which says 'Every US\$1 invested in the WHO Best Buys will yield a return of at least US\$7 by 2030' (WHO 2018: 3).

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'Best Buys' are the lifestyle policies favoured by the WHO, including higher taxes on tobacco, reformulating food, and restricting the availability of alcohol. The authors of *Saving Lives, Spending Less* claim that fully implementing the WHO's sixteen Best Buys 'can generate \$350 billion in economic growth between now and 2030'. Closer inspection of their methodology shows that neither the 7:1 claim nor the \$350 billion claim actually relate to economic growth. As with the 14:1 claim, the authors bundle together real financial benefits with huge estimates based on the social value of a life year. They further compound the problem by ignoring the additional costs that will be incurred by those who live longer.

This is ironic because the WHO had previously warned against producing spurious cost-saving claims in this way. In a 2009 publication, it acknowledged that public health interventions, if successful, were likely to lead to a net increase in health expenditure (WHO 2009: 21):

The initial gains from eliminating the disease this year ... might well be offset by the eventual increased expenditure... if all smokers were to quit, population-level health care costs would actually be greater in the long term, due to their increased survival and exposure to other risks to health. Traditional cost-of-illness studies do not include this consideration and therefore overestimate the present value of health resources that would be saved by the elimination of the disease for one year.

It also recognised that the impact of public health gains on economic growth may not necessarily be positive (ibid.: 35):

The evidence provided by this literature strand has challenged the dominant view that health improvements are conducive to economic growth, both in absolute and per capita terms.

Whatever the merits of portraying health gains in monetary terms, the 'social returns on investment' have little to do with economic growth or saving taxpayers money. The misrepresentation of intangible benefits to individuals as financial benefits to taxpayers and the economy encourages policy-makers to believe that the economy will benefit from a large multiplier effect from public health interventions which simply does not exist.

## Cost-saving

It is a cliché to say that a stitch in time saves nine, or that an ounce of prevention is worth a pound of cure, and it is true that public health measures - like conventional healthcare - can avert future health problems and therefore prevent future healthcare costs. But these savings are less common than many people believe.

A study published in the *Journal of Public Health* found that just 15 per cent of public health interventions in England were cost-saving (Owen et al. 2012). This is in line with a systematic review published in the *New England Journal of Medicine* which found that fewer than 20 per cent of preventive measures ultimately save money (Cohen et al. 2008). The majority led to greater healthcare costs in the long run as people aged and developed other health conditions.

The mechanisms by which preventive health measures increase spending are well understood by those who choose to acknowledge them. In addition to the cost of implementing them, they tend - if successful - to lead to more years being lived in old age, thereby requiring more spending on healthcare and welfare at a time when the individuals are paying less tax than they receive in benefits and services. The 15 to 20 per cent of cost-saving exceptions typically include extending the healthy life of younger people. For example, measures to reduce the number of young people being involved in serious motorcycle accidents are likely to reduce state spending overall. A person who is confined to a wheelchair and unable to work is almost certain to incur a net financial loss, as is someone who is killed in their teens. It is for this reason that vaccinating children against deadly or lifelong diseases is among the most cost-effective and cost-saving public health interventions.



The same cannot be said of public health measures which tend to increase lifespans in old age. The main economic impact of efforts to reduce consumption of salt and cigarettes, for example, will be to increase the size of the elderly cohort, thereby raising demand for health and social services. I have discussed this at length in a previous IEA paper (Snowdon 2015).

## Cost-effectiveness

Since most public health measures do not save money, the real question is whether they are cost-effective. This is where it is appropriate to put a monetary value on a year of healthy life. The Department of Health values a quality-adjusted life year (QALY) at £60,000, so a health intervention that extends a person's healthy life by a decade at a cost of £10,000 a year can be said to have created value of £600,000 and a 6:1 return on investment.

One reason for calculating the social value of a QALY is to determine how much society is prepared to pay for increases in life expectancy. Since 1999, the National Institute for Clinical Excellence has considered an intervention to be cost-effective if it delivers a QALY at up to a limit of between £20,000 and £30,000. This somewhat arbitrary rule of thumb is essentially an estimate of how much society is prepared to pay for an extra year of life. In principle, any figure below £60,000 would be cost-effective, but resources are scarce and budgets are limited. The NICE guideline is designed to ensure that NHS resources are directed to where they can have the most impact.

On average, NHS healthcare produces a QALY at a cost of £13,000, implying an ROI of 4.6 to 1. If the figures in Masters et al. (2017) are correct, public health measures compare favourably, with an ROI of 14:1.

The case for more public health funding looks to be an open and shut case at first glance. If preventive health can produce an ROI of 14:1, it makes sense to put more money into public health and less into healthcare. But there are important caveats. Firstly, Masters et al. (2017) found that the ROI for public health services *provided by local authorities* is only 4:1. This is significant because local authorities have been responsible for public health provision in England since 2013. The average public health

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intervention provided by local authorities is therefore slightly less cost-effective than the average NHS healthcare intervention.

But averages hide complexity. The 14:1 figure is an average taken from a review of a broad range of interventions, including HIV/AIDS prevention, road safety campaigns, needle exchanges, vaccination, smoking cessation, workplace health promotion, water fluoridation, obesity management and early education programmes. Not only is there no single public health policy to evaluate but many public health directors have extended their remit to a host of more complicated political issues, including 'reducing violent crime, economic policy, educational attainment ... environmental sustainability ... children's services, parks and green spaces, transport, libraries, and housing policy' (Fell and McManus 2020).

When we look at individual public health interventions, the return on investment varies enormously. A study of public health services in England found that the cost of a QALY ranges from £300 to £82,000,000 (Owen et al. 2018).

Most public health interventions are cost-effective under the standard measure, but many are not. Owen et al. (2012) found that 85 per cent were cost-effective at the £20,000 QALY threshold. In an update of that analysis, published in 2018, they found that the number of cost-effective interventions was just 63 per cent (Owen et al. 2018). In other words, over a third of public health interventions would not be approved if they were NHS treatments.

If public health professionals are competent and rational actors, they will spend the first million pounds of their budget on the most cost-effective intervention. The next million will be spent on a somewhat less cost-effective project, and so on until it becomes more efficient to buy a QALY with healthcare than with prevention. The more money they spend, the lower the return on investment. There are diminishing marginal returns.

Alas, we must consider the possibility that public health professionals are *not* always competent and rational actors. If so, money will be wasted on projects which are relatively inefficient, if not absolutely useless. The finding that 37 per cent of public health interventions are not cost-effective suggests that this is a real problem (Owen et al. 2018). In the UK, Public Health England has spent large sums of money on mass food reformulation, for which there is no evidence of efficacy, while local public health directors

have successfully lobbied for fast food zoning laws despite a large body of evidence suggesting that they have no benefit (Snowdon 2018).

Among the more cost-effective interventions identified by Owen et al. (2018) are personalised advice to encourage walking and cycling (£300 per QALY), dietary education and cooking skills (£878 per QALY), skin cancer prevention advice to parents (£6,700 per QALY), obesity and smoking management advice in pregnancy (less than £10,000 per QALY), physical activity brief advice in primary care (£1,730 per QALY), hepatitis C testing in addiction services (£14,700 per QALY), and cognitive behavioural therapy for harmful sexual behaviour (£2,685 per QALY).

Much less cost-effective are skin cancer prevention advice to children (£260,000 per QALY), mandatory 20mph zones (£89,000 to £458,000 per QALY), winter fuel subsidies (£39,000 to £358,000 per QALY) and physical activity referral schemes (£89,000 per QALY).

It is notable that many of these interventions are delivered by the NHS and other public services (e.g. prisons), rather than by local authorities and Public Health England. This further complicates the picture because, as Hinde et al. (2017) note, NICE's economic evaluations tend to ignore the costs to other sectors, including the private sector.

It not possible to tell from the available data whether the current public health budget of £4 billion is too little, too much or about right, but the law of diminishing returns leads us to two conclusions. Firstly, the marginal ROI will decline as more money is spent. Secondly, spending more money on public health will not always be the best use of resources.

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## Internal costs

Cost-benefit calculations which depend on intangible benefits bestowed on individuals fall apart when the intervention inflicts intangible costs on those same individuals. The intangible costs of traditional public health policies are generally trivial (e.g. the slight pain of a TB jab or the opportunity cost of being screened), but they have become more significant since 'public health' turned towards coercive forms of lifestyle regulation, banning or taxing certain products and activities.

Assuming individuals understand the health risks of excessive drinking, smoking, sedentary behaviour and over-eating, the intangible costs of a lost QALY are priced in by the individual. They are making a trade-off between the private benefits they enjoy from their lifestyles and the potential cost to their health. If, for example, I am prepared to take a twenty per cent chance of dying ten years early to enjoy my vice of choice, I am valuing my vice at more than £120,000 (i.e.  $£60,000 \times 10 = £600,000$  divided by five), plus the out-of-pocket cost of buying the product.

The social value of pleasure is as legitimate as the social value of a life year. No serious cost-benefit evaluation can include the latter without including the former. If the state uses coercion to make me abandon my vice against my will, I will be worse off; I will have lost thousands of pounds of intangible benefits. This is of great relevance when you consider the WHO's Best Buys, most of which are focused on making 'unhealthy' lifestyle choices more expensive, less convenient and less enjoyable. Many of the policies promoted at the taxpayer's expense by Public Health England and local public health directors incur the same kind of costs. If they were included in the analysis, the overall cost-effectiveness of public health spending would be further reduced.

## Conclusion

If prevention is worth a pound of a cure, it seems obvious to invest more in prevention and less in cure. The obvious answer is not always the correct one, however, and this paper aims to demonstrate that multi-billion-pound spending decisions should not be guided by folk wisdom.

The use of terminology from business and economics, such as 'return on investment', is liable to mislead the public and policy-makers into believing that public health interventions generate economic growth and save taxpayers money in the long run. In most cases, this is not true.

Less than twenty per cent of public health interventions are cost-saving and more than a third of those evaluated by NICE are not cost-effective. On average, public health services provided by local authorities are slightly less cost-effective than healthcare services provided by the NHS, albeit with the caveat that averages hide a very broad range of cost estimates in both sectors.

Moreover, the cost of many public health interventions has been underestimated because evaluations do not factor in the costs to the private sector and other parts of the public sector. In the case of some lifestyle regulations, the cost to individuals in forgone utility is also wrongly ignored.

We would expect diminishing marginal returns from public health spending even if public health professionals were perfectly rational actors who prioritised the most cost-effective interventions. In practice, there is evidence that budgets are not spent rationally. Projects are pursued despite evidence showing that they are not cost-effective and may not be effective at all.

From this brief overview of UK budgets, it is not possible to tell whether it would be more efficient to spend more money on public health and less on healthcare or vice versa, but many of the arguments made for increased spending on public health are based on a misunderstanding of economics.

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