



Using financial incentives to achieve healthy behaviour

Paying people to change their behaviour can work, at least in the short term. However, as **Theresa Marteau, Richard Ashcroft, and Adam Oliver** explain, there are many unanswered questions about this approach

Personal financial incentives are increasingly being used to motivate patients and general populations to change their behaviour, most often as part of schemes aimed at reducing rates of obesity, smoking, and other addictive behaviours (table). Opinion on their use varies, with incentives being described both as “key to reducing smoking, alcohol and obesity rates” and as “a form of bribery” and “rewarding people for unhealthy behaviour.” We review evidence on the effectiveness of financial incentives in achieving health related behaviour change and examine the basis for moral and other concerns about their use.

Do personal financial incentives work?

Financial incentives and disincentives inform the fiscal policies of all governments. Disincentives, in the form of tobacco and alcohol taxes, are known to affect behaviour,¹⁰ but the effect of positive financial incentives is less clear. In theory, they work on learning theory principles by providing an immediate reward for behaviours that usually provide health gains in the longer term.¹¹ They also capitalise on “present bias,” a tendency for many of us to pursue smaller immediate rewards instead of rewards that are distant but more highly valued.¹²

Financial incentives form part of pro-

grammes in low and middle income countries aimed at breaking intergenerational cycles of poverty.¹³ Payments, known as conditional cash transfers, are made for using prevention services and achieving educational targets. Although these programmes improve health outcomes, uncertainties remain about the processes by which the payments work, their effect sizes, and cost effectiveness.¹⁴

In high income countries financial incentives have most often been used as part of programmes targeting behaviours that have been characterised as “the giants of excess.”¹⁵ These include the excessive consumption of tobacco, food, and alcohol, use of illegal drugs; and sedentary pursuits such as watching television and driving cars.

Evidence for the short term effectiveness of financial incentives is strongest in drug misuse programmes. Meta-analyses of interventions involving the provision of vouchers contingent on abstinence and related behaviours, show improved outcomes with an overall medium effect size.^{16 17} These effects are larger the greater the voucher’s monetary value, and the closer in time it is given to the measurement of the targeted behaviour.¹⁶

The effect of incentives in achieving sustained drug abstinence remains uncertain. The

sustainability of incentivised behaviour change has, however, been examined in the contexts of smoking and weight reduction.

None of the 17 trials included in a recent Cochrane review of the effect of incentives on smoking cessation showed higher quit rates at six months when incentives were used.¹⁸ The authors noted, however, that the trials were often underpowered and of variable quality. In addition, most incentives were small. However, a recent trial, the largest to date, offered up to \$750 (£510; €560) to employees of a large organisation. The incentives were incremental and tied to the completion of a smoking cessation programme, as well as to abstinence at 6 and 12 months, with the largest sum deliverable for 12 months’ abstinence (\$400). This is the first trial to show that personal financial incentives can lead to significantly higher sustained quitting at one year.¹⁹ While promising, it requires replication.

A meta-analysis of nine weight loss trials with follow-up of a year or more showed no improvement from the use of incentives on weight loss or maintenance at 12 or 18 months.²⁰ The authors did, however, note a weak trend in favour of incentives being more effective when they comprised more than 1.2% of individuals’ incomes.

Financial incentives have been more effective in increasing performance of relatively discrete, infrequent behaviours such as attending clinic appointments or having vaccinations, particularly in low income groups.¹⁰ Such incentives have also been shown to improve adherence to treatment for tuberculosis in low income populations.^{21 22} They may also be effective in increasing adherence to anti-psychotic medication.⁴

Unintended consequences

Three unintended consequences of offering financial incentives to change behaviour have been described, for which there are varying degrees of evidence. These relate to intrinsic motivation, informed choices, and the nature of the doctor-patient relationship.

Examples of current incentive schemes aimed at changing health related behaviours

Target	Population	Incentive
Smoking cessation	Pregnant women, Essex ¹	£20 food vouchers for one week cessation; £40 after four weeks; £40 at one year
	Children, Brighton and Hove ²	£15 in vouchers for 28 days’ cessation
Managing chronic conditions	Diabetic employees, US ³	\$200-\$600 towards healthcare costs for treatment adherence
	Psychotic patients, east London ⁴	£5-£15 per injection
Avoiding sexually transmitted diseases	Men and women aged 15-30, Tanzania ⁵	\$45 for regular negative laboratory tests for sexually transmitted diseases
Weight loss	Overweight residents, Varallo, Italy ⁶	\$67 for achieving target weight; \$268 and \$670 if maintained for 5 and 12 months, respectively
	Overweight residents, Kent ⁷	£70-£425 for reaching personal weight loss targets
Child development	Households in the PROGRESA programme, Mexico ⁸	Financial incentives to families for engaging in behaviours to improve health and educational attainments
Healthy eating	School pupils, East Ayrshire ⁹	Points earned by eating healthy school meals which are exchanged for farm animals, medical supplies, and classroom equipment for Save the Children projects abroad

Moral concerns relating to use of financial incentives to change health behaviour*Bribery*—Paying people to act against their wishes*Coercion*—Compels people to behave using threats*Paternalistic*—Undermines individual autonomy*Unfair*—People should not be paid to do what they should do anyway*Waste of money*—Poor use of the public purse, where there are many competing demands*Not a bribe*—Offered to achieve outcomes most people desire*Not coercive*—Voluntary with prospect of gain (not loss)*Promotes autonomy*—Facilitates autonomy when it makes it more likely that people act in line with their considered preferences*Promotes fairness*—Potentially more potent means of changing behaviour in the most socially deprived, thereby reducing health inequities*Promotes efficiency*—Potentially large health benefits from a modest increase in health expenditure

How financial incentives affect motivation has been extensively studied in the classroom and workplace.^{23 24} A meta-analysis of 128 experiments conducted under laboratory-like conditions found that intrinsic motivation, as assessed by persistence in a task when rewards are stopped, was undermined by the use of rewards.²³ The extent to which these effects are evident when incentives are used to achieve health related behaviour change is unknown.

The decision whether to engage in an incentivised behaviour is particularly important when the target behaviour has the potential to cause harm, as is the case with taking some medicines. Not only do individuals have preferences that differ across time, they often have competing preferences at any one time. So, for example, faced with taking antipsychotic drugs, an individual may weigh the prospect of the side effects of excessive weight gain and the risk of diabetes against a reduced chance of a further psychotic episode. Incentives may resolve this ambivalence, resulting in the person taking the medicine. However, if the threat of side effects is downplayed in the face of short term financial reward, the individual may be less prepared for their occurrence and subsequently blame the prescribing physician. It remains an empirical question how incentives might be offered to facilitate and not erode informed choices.

Finally, offering patients incentives alters what is generally considered an exchange based on trust between patient and doctor to one in which the exchange becomes financial.²⁵ Whether and in what ways the use of financial incentives alters the nature of doctor-patient relationships merits empirical investigation.

Is it wrong to use incentives?

Even when incentives change behaviour, their use in health contexts has attracted criticism. Some of the most vociferous criticism by professionals has focused on the offer of payment to patients for adherence to antipsychotic drugs,²⁶ with healthcare professionals viewing such schemes as undermining patients' autonomy and personal responsibility, as well as damaging the trust inherent in the doctor-patient relationship. Similar views are evident in public attitudes towards the use of incentives in other healthcare contexts.²⁷ Their use has often been construed as a form of bribery and coercion (box).

A psychological perspective provides an alternative conceptualisation. We do not always act in ways that, with hindsight, we most prefer.²⁸ So, for example, most people would prefer to eat more healthily and to be more physically active than they actually are. Similarly, most smokers would prefer not to be smokers. This gap between our "first order desires" (those we act on) and our "second order desires" (those we would have preferred to have acted on) reflects two strong forces: the power of immediate rewards and the automatic cueing of much of our behaviour by environments.^{29 30} Offering a reward can help people to align their actions more closely with their true preferences. From such a perspective, incentives operate to enhance rather than to restrict autonomy.

The use of incentives raises two further concerns, relating to justice. Firstly, do incentives reward adverse behaviours (and indeed encourage them, so that individuals become entitled to the incentives) in ways that are unjust? Secondly, does the effect of incentives differ among socioeconomic groups? Is distribution of effect fair? And do they have a positive or negative effect on health equity? The extent to which these moral concerns are valid is unknown, and we need studies of incentive schemes that measure complex constructs such as coercion, autonomy, and preferences.

Unanswered questions

While there is some evidence that incentives can change behaviour, the conditions under which change is achieved and sustained, and for whom, require elucidation, as do the conditions under which unintended consequences occur. Systematic programmes of research, based on established principles of behaviour change, are needed that go beyond the question, "Do incentives work?" to examine a range of potential modifiers of responses to financial and other incentives including the type and magnitude of the incentive, the target behaviour, and population. The processes

by which behaviour is initiated and maintained also require study within the context of a broader initiative aimed at developing the science of behaviour change.³¹ Elucidation of these processes will also inform the debate about the morality of using financial incentives to change behaviour.

For those developing incentive schemes, the literature provides some guidance on effective components. Schemes targeting habitual behaviours such as smoking or physical inactivity may be more effective if they provide valued incentives for initial as well as sustained behaviour change, delivered intermittently and as part of effective behaviour change programmes. For schemes aimed at initiating relatively simple behaviours in low income populations such as clinic attendance and participation in vaccination programmes, small incentives delivered immediately seem most effective.

Where next

Offering personal financial incentives is one of several means by which behaviour may be changed, ranging from the provision of information to legislation restricting or banning a behaviour. Using payments can be more powerful than providing information and less restrictive than legislation. Programmes using financial incentives can be seen as part of a broad approach termed libertarian paternalism—libertarian in that people are free to act as they choose, but paternalistic in that those who design the intervention are encouraging behaviours that make the actors better off, as defined by the actors themselves.³²

Even when effective, the use of financial incentives will depend on its acceptability to general populations, healthcare professionals, and policy makers alike. We need to clarify the frameworks within which to discuss and judge the acceptability of incentive schemes. Ultimately, if personal financial incentives prove to be effective and acceptable in only a few contexts, they may still offer an important means by which to improve population health.

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ANSWERS TO ENDGAMES, p 1019 For long answers use advanced search at bmj.com and enter question detail

PICTURE QUIZ

A man with Wegener's granulomatosis and haemoptysis

- Bilateral air space infiltration (figs 1 and 2) and haemoptysis suggest a relapse of Wegener's granulomatosis, with pulmonary capillaritis causing diffuse alveolar haemorrhage. Pneumonia and pulmonary embolus are differential diagnoses. Haemoptysis could also be caused by bronchiectasis, malignancy, uraemia, coagulopathy, or congestive cardiac failure.



Fig 1 Chest radiograph showing bibasal and right upper lobe air space shadowing



Fig 2 Computed tomography of the chest confirming bilateral air space infiltrates (arrowheads) and surrounding ground glass shadowing

- Bronchoscopy is useful because lavage specimens are increasingly blood stained in diffuse alveolar haemorrhage; gas transfer is raised on pulmonary function testing in this condition. Microbiological analysis of sputum, blood, and

bronchoalveolar lavage specimens is needed to identify an infective component.

- Diffuse alveolar haemorrhage—a severe complication of active vasculitis. Intravenous cyclophosphamide and

methylprednisolone should be given promptly. Plasma exchange may be needed. Antimicrobials should be given if infection is suspected. Oral glucocorticoids, azathioprine, or mycophenolate can be used to maintain remission.

STATISTICAL QUESTION

Outcome measures in case-control studies

a, c