Judging nudging: can ‘nudging’ improve population health?

The concept of ‘nudging’ has captured the imagination of the public, researchers and policy makers as a way of changing human behaviour. It has found particular favour with the new coalition government in the UK and the Obama administration in the US. Does it stand up to scientific scrutiny as the basis for improving population health?

Introduction

If people didn’t smoke, drank less, ate healthier diets and were more active, the huge burden of chronic diseases including cancer, heart disease and type 2 diabetes would be much reduced. The prospect of being able to nudge populations into changing their behaviour has generated great interest among policymakers worldwide, including the UK government. In this paper, we explore what nudging is and assess the prospect of nudging our way to a healthier population. We begin by placing nudging within the broader perspective of behavioural science, and go on to examine the evidence for nudging as the basis for a public health strategy. We conclude with some recommendations for action and a note of caution.

Understanding behaviour change

Most people value their health yet persist in behaving in ways that undermine it. This can reflect a deliberate act on the part of individuals who happen at different moments in time to value other things in life more highly than their health. It can also reflect a non-deliberate act. This gap between values and behaviour can be understood using a ‘dual process’ model in which human behaviour is shaped by two systems. The first is a reflective, goal oriented system driven by our values and intentions. It requires cognitive capacity or thinking space, which is limited. Many traditional approaches to health promotion depend on engaging this system. Often based on providing information, these are designed to alter beliefs and attitudes, motivate people with the prospect of future benefits, or help them develop self-regulatory skills. At best, these approaches have been modestly effective in changing behaviour.

The second is an automatic, affective system that requires little or no cognitive engagement, being driven by immediate feelings and triggered by our environments. Despite wishing to lose weight, for example, we still buy the chocolate bar displayed by the checkout till. Such environmental cues combine with the power of immediate and certain pleasure over larger, less certain and more distant rewards to make unhealthy behaviour more likely. This suggests an approach to behaviour change that focuses on altering environmental cues to prompt healthier behaviour. Such an approach is readily embraced by advertisers and retailers and, increasingly, by public health specialists. Nudging mainly operates through this automatic, affective system.

What exactly is nudging?

The term Nudge was first used in a book of the same title to describe “…any aspect of the choice architecture that alters people’s behaviour in a predictable way without forbidding any options or significantly changing their economic incentives” (p. 6). It is exemplified by a simple intervention that substantially increased the amount that
people saved for their retirement: an opt-in system in which people had to make a positive choice to set aside savings from their salaries was replaced by an opt-out system in which savings were made by default.

The original definition of nudging excludes legislation, regulation and interventions that involve altering economic incentives. Aside from these exclusions, nudging could involve a wide variety of approaches to altering social or physical environments to make certain behaviours more likely. These might include providing information about what others are doing (“social norm feedback”) framed to make healthy behaviours more salient, changing the defaults that surround the serving of food and drinks, or altering the layout of buildings to cue physical activity (Box). We note, however, that a precise, operational definition of nudging has thus far eluded these authors. This may reflect a reality, namely that nudging is at best a fuzzy set intended to draw attention to the role of social and physical environments in shaping our behaviour and not to inform a scientific taxonomy of behaviour change interventions.

Nudging is not new. It builds on psychological and sociological theory dating back over a century that demonstrates how environments shape and constrain human behaviour — often far more than humans like to believe. Its novelty lies in two features. First, it draws upon behavioural economics as well as social psychology, to explain why people behave in ways that deviate from rationality as defined by classical economics. Second, it is embedded in a particular political philosophy, libertarian paternalism, in which people’s choices are actively guided in their best interests but they remain at liberty to behave differently.

The appeal of nudging is self-evident: it proposes a set of seemingly simple, low cost solutions that do not require legislation and can be applied to a wide array of problems arising from our behaviour. The absence of legislation holds particular appeal for governments and others wanting a smaller role for the state in shaping the behaviour of its citizens.

Does nudging work?

Nudging certainly works. Shaping environments to cue certain behaviours is extremely effective, unfortunately often to the detriment of our health. The ready availability of foods, packaged, presented and engineered to stimulate our automatic, affective system has led us to consume more than we need — consumption that is further primed by advertising. The doubling in alcohol consumption in young people over the past fifty years is attributed in part to its marketing and ready availability, and the design of many neighbourhoods supports car driving over walking or cycling.

While nudging can certainly trigger behaviours that worsen our health, can it also be used to cue behaviours that improve it? There are various descriptions of nudges being used to change behaviour to improve health outcomes (Box). For example, putting yellow duct tape across the width of supermarket trolleys with a sign requesting shoppers to place fruit and vegetables in front of the line doubled fruit and vegetable purchasing, and placing fruit by the cash register increased the amount of fruit bought by school children at lunchtime by 70%. Providing information on the healthy behaviour of others (social norm feedback) is the most extensively studied
form of nudging, particularly in the context of alcohol consumption amongst students. Interventions have been delivered using a range of methods including social marketing campaigns and giving feedback in groups and to individuals, delivered in letters or via the internet. While there is evidence of effectiveness for internet feedback, there is little for the others.

To date, few ‘nudging’ interventions have been evaluated for their effectiveness in changing behaviour in general populations and none, to our knowledge, has been evaluated for its ability to achieve sustained change of the kind needed to improve health in the long term. It has also been suggested that nudging is likely to offer good value for money, but this cannot be assumed, because to our knowledge, no evaluations of nudges provide evidence of cost-effectiveness. Some environmental changes are potentially very expensive, and individualised feedback of social norms may also be a costly strategy.

It may, of course, be misguided to expect evidence of such outcomes from individual nudges: more realistically, cumulative nudges in a wide range of contexts may be required, within enabling legislative and policy environments. Effective nudging may require legislation, either to implement healthy nudges (such as displaying fruit at checkouts) or to prevent unhealthy nudges from industry (such as food advertising aimed at children). Voluntary agreements can sometimes be modestly effective. For example, salt consumption in the UK has been reduced by 0.9 g per person per day as a result of agreements by food manufacturers and led by the Food Standards Agency, although these were reinforced by a threat of legislation. This achievement contrasts with reductions of 5 g per person per day in Finland and Japan which followed legislation. In general, self-regulation by the food, alcohol and tobacco industries has historically been less effective than legislation as a means to improve population health.

At present, the evidence to support the view that ‘pure’ nudging can improve population health is weak. There is therefore a need for both primary research and synthesis of existing evidence to examine the effectiveness and acceptability of the types of intervention that fall under the general heading of nudging. Given the diversity of interventions involved, evidence synthesis should place different types of nudges within a more comprehensive taxonomy of approaches to behaviour change. Furthermore, this work should not be limited to addressing the question ‘what works’, but should adopt a more realist position (‘what works, for whom, in what circumstances and for how long?’), comparing the effects of different types of nudges in different regulatory environments. It is possible that nudging may help to promote a culture accepting of legislation, and its subsequent use, suggesting a possible role for historical and anthropological critiques in understanding its possible contribution to altering long term behaviour trends in populations. The effect sizes obtained from nudging in different regulatory environments could also be compared to those of other approaches such as regulating pricing and advertising, with outcomes including impacts on health inequalities and cost-effectiveness. We could then begin to judge what nudging contributes to the existing policy toolbox for improving population health and reducing inequalities.

Could nudging be harmful?
As with any intervention, a public health strategy based on nudging has the potential to generate harms as well as benefits.

Direct harm may arise from perverse response to nudges. For example, labelling foods as ‘healthy’, or making healthier side dishes the default, can lead to a ‘halo’ effect resulting in underestimation of energy content and consequent excess consumption. For example, in one study a hamburger was estimated to contain 697 calories when presented alone but 642 when presented with three celery sticks, an effect that was more marked amongst those concerned about managing their weight. These findings illustrate why evaluations must include the capacity to identify paradoxical or unexpected effects of seemingly benign nudges.

In *The strategy of preventive medicine*, Rose contrasted two approaches to improving population health. The first involves targeting individuals at high risk, for example by identifying and treating individuals with high blood pressure to reduce their risk of stroke. The second involves shifting the population distribution of a risk factor, for example by reducing population salt intake — and therefore mean blood pressure — with the aim of reducing the overall incidence of stroke. While these are complementary rather than alternative strategies, there is growing evidence that whole population approaches may be more effective both in improving population health and in reducing health inequalities, with strategies that target high risk individuals alone tending to widen health inequalities.

While nudging relates more closely to whole population approaches to disease prevention, indirect harm might arise were an emphasis on nudging to result in a neglect of potentially more effective population level interventions. Recent reports highlight the continuing importance of addressing the economic and regulatory environments in the areas of alcohol, obesity and tobacco control. For example, regulations to limit the availability of alcohol are more effective than voluntary agreements with the alcohol industry in reducing alcohol related harm; a review of measures to tackle obesity has concluded that pricing interventions and regulation of food labelling and marketing to children are likely to produce the largest health gains in the shortest timeframes; and the balance of evidence suggests that increasing the price of tobacco may be more effective in reducing smoking in lower-income adults and those in manual occupations, which cannot be said for other approaches such as printing health warnings on cigarette packets.

**Conclusions**

*Nudge* and similar recent popular texts have stimulated policymakers to think about altering environments to change behaviour. These developments are to be welcomed. Evidence to support the effectiveness of nudging as a means to improve population health and reduce health inequalities is, however, weak. This reflects absence of evidence as well as evidence of little or no effect.

Without regulation to limit the potent effects of unhealthy nudges in existing environments shaped largely by industry, nudging towards healthier behaviour may struggle to make much impression on the scale and distribution of behaviour change needed to improve population health to the level required to reduce the burden of chronic disease in the UK and beyond.
2033 words

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### Box: Examples of nudging and regulating actions

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<th><strong>Regulating</strong></th>
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<tr>
<td>Smoking</td>
<td>Make non-smoking more visible through mass media campaigns and communicating that the majority do not smoke and the majority of smokers want to stop</td>
<td>Ban smoking in public places</td>
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<td>Reduce cues for smoking by keeping cigarettes, lighters and ashtrays out of sight</td>
<td>Increase price of cigarettes</td>
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<tr>
<td>Alcohol</td>
<td>Serve drinks in smaller glasses</td>
<td>Regulate pricing through duty or minimum pricing per unit</td>
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<td></td>
<td>Make lower alcohol consumption more visible through highlighting in mass media campaigns that the majority do not drink to excess</td>
<td>Raise the minimum age for purchase of alcohol</td>
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<td>Diet</td>
<td>Designate sections of supermarket trolleys for fruit and vegetables</td>
<td>Restrict food advertising in media directed at children</td>
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<td>Make salad rather than chips the default side order</td>
<td>Ban industrially-produced trans fatty acids</td>
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<td>Physical activity</td>
<td>Make stairs, not lift, more prominent and attractive in public buildings</td>
<td>Increase duty on petrol year on year (fuel price escalator)</td>
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<td></td>
<td>Make cycling more visible as a means of transport, e.g. through city bike hire schemes</td>
<td>Enforce car drop-off exclusion zones around schools</td>
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References