

# Applying behavioural insight to health

# Foreword

Many of the most pressing public policy issues cannot be addressed without thinking about the behaviour of individuals. Behavioural science and behavioural economics show us that, very often, we do not behave in a way that we would be expected to if we were perfectly 'rational' human beings. Many of us still have not insulated our lofts, despite the fact that doing so will reduce our energy bills; we very rarely switch our bank accounts, despite the fact that we may benefit from higher saving rates elsewhere; and we may not yet have committed to becoming an organ donor, despite the fact that the majority of us would be willing to do so if asked.

This paper shows that, by understanding how people react and behave in different situations, we can design policy to go with the grain of how people behave rather than against it, both improving outcomes and respecting people's autonomy. Improving the health of citizens and communities is a clear case of where we need to apply this type of thinking. Prompting people to become organ donors when they register for a driving licence is a great example of this – and one that will ultimately save lives.

This is not a traditional government document. In many ways it reflects a new approach, which is as much about government working in partnership with others as about announcing new policies from Whitehall. An example of this is the work on smoking cessation, the result of a partnership between the Behavioural Insights Team, Department of Health and Boots, which will test new ways of encouraging people to make more effective quit attempts. This paper contains numerous other examples, which are designed to help ministers and officials to develop policy that is less intrusive, imposes fewer costs on business and society and is often more cost-effective than traditional regulatory or legislative interventions.

One of the key points made in the recent Public Health White Paper is to give local communities the capacity and confidence to try out and evaluate the kinds of approaches illustrated by this paper. We therefore hope that the fresh approach this document brings will spark new ideas and innovation across our local communities.



Anne Milton  
Parliamentary Under Secretary of  
State for Public Health



Oliver Letwin  
Minister for Government Policy

# Summary of contents

## Introduction

This sets out the importance of behaviour in policy making, the role of the Behavioural Insights Team in the Cabinet Office and how behavioural science insights can be applied to health using the MINDSPACE framework.

## Case studies

1. **Smoking:** drawing on commitment and incentive devices, we are launching a new smoking cessation trial with Boots.
2. **Organ donation:** we are introducing a trial of 'prompted choice' for organ donation, which we believe will significantly increase the number of donor registrations.
3. **Teenage pregnancy:** how teenagers who mentor toddlers are significantly less likely to become teen parents themselves.
4. **Alcohol:** Welsh universities will be trialling new methods to encourage students to drink less alcohol using social norm techniques.
5. **Diet and weight:** we will be establishing a partnership with LazyTown, the popular children's TV show, which will encourage healthier behaviour in children.
6. **Diabetes:** new devices are helping children to manage their conditions in ways that are practical and fun.
7. **Food hygiene:** how the new National Food Hygiene Rating Scheme will empower people to make better choices when it comes to the hygiene standards of food.
8. **Physical activity:** numerous innovative schemes have been set up, including the 'Step2Get' initiative in London, which incentivises pupils to walk to school.
9. **Social care:** we have established a partnership to develop a reciprocal time credit scheme to help catalyse peer-to-peer provision of social care.

## Conclusion

These approaches show the effect that behavioural insights can have upon citizens' health and wellbeing. We must continue to grow and share our evidence base, evaluating new approaches as we go.

## Acknowledgements

The Behavioural Insights Team would like to thank in particular Department of Health ministers and officials, whose expertise and support were vital. Thank you also to all the organisations and individuals who developed these innovative examples and ideas, as well as the academics who we consulted. If you'd like to share with us ideas and initiatives that demonstrate an application of behavioural insight to health, please email the Department of Health team at: [behaviouralinsights@dh.gsi.gov.uk](mailto:behaviouralinsights@dh.gsi.gov.uk)

**This is a discussion paper. Its purpose is to encourage public debate.**

# Introduction

## The importance of behaviour

“There has been the assumption that central government can only change people’s behaviour through rules and regulations. Our government will be a much smarter one, shunning the bureaucratic levers of the past and finding intelligent ways to encourage, support and enable people to make better choices for themselves.”

Coalition Commitment, May 2010<sup>1</sup>

Many of today’s most important policy issues have a strong behavioural component. From crime and anti-social behaviour, to education and health – our behaviours as citizens, parents and neighbours significantly affect the quality of our lives and that of others.

The Government can influence people’s behaviour in a number of different ways. Tough laws could be implemented, with fines for those who fail to comply with new legislation, and bans could be introduced that prevent people from eating certain types of food or engaging in particular types of activities.

But, as this paper shows, there are many options between bans and doing nothing – the false choice implied by some commentators. We can give citizens more or better information. We can prompt people to make choices that are in line with their underlying motivations. And we can help to encourage social norms around healthier behaviours in ways that avoid Cialdini’s ‘Big Mistake’ (see box).

This new approach, which draws on insights from behavioural science and behavioural economics and is embedded in the recently published Public Health White Paper, represents an important part of the Coalition Government’s commitment to reducing regulatory burdens on business and society, and achieving its policy goals as cheaply and effectively as possible.

It is also part of the Government’s answer to how we can spend public money more effectively. We currently spend over £2.5 billion a year on treating smoking-related illness, but less than £150 million on encouraging smoking cessation. We spend an estimated £2.7 billion on treating the results of excessive alcohol consumption, but only £8.7 million on promoting healthy drinking levels (against £800 million spent on promotion by the alcohol industry).<sup>2</sup>

### Avoiding Cialdini’s ‘Big Mistake’<sup>3</sup>

Robert Cialdini, Professor of Psychology and Marketing at Arizona State University and author of one of the most widely read books on the psychology of influence, argues that policy makers and professionals are prone to a frequent mistake. In their well-intentioned desire to highlight and address important social issues, policy makers often inadvertently communicate that the ‘problem behaviour’ – be it not paying your taxes or dropping litter – is relatively widespread. This signals to people that, even if we don’t like or approve of the behaviour, lots of other people are doing it. And, if we know anything from behavioural science, it is that behaviour is strongly influenced by what we think others are up to (see Section 4 on student drinking).

This paper does not attempt to be comprehensive or to suggest that behaviour change techniques are the silver bullet that can solve every problem. Rather, it sets out numerous examples of where local authorities, charities, government and private sector organisations are already developing responses that encourage healthier behaviours. It also points to where more could be done. And finally, in many areas – including organ donation and smoking cessation – this paper demonstrates how the Behavioural Insights Team has been working with partners to introduce new and innovative policy solutions.

## The role of the Behavioural Insights Team

The Behavioural Insights Team plays a key role in this agenda by supporting government departments in designing policy that better reflects how people really behave, not how they are assumed to behave. In carrying out this role, the Behavioural Insights Team draws on academic and empirical evidence from the world's leading behavioural economists and social psychologists. This academic research is a valuable tool in helping ministers and officials to develop policy that is less intrusive, imposes fewer costs on business and society and is often more effective than traditional regulatory or legislative interventions.

The Behavioural Insights Team is a small team of civil servants and academic experts based in the Cabinet Office. It is led by Dr David Halpern, and has a steering group chaired by the Cabinet Secretary Sir Gus O'Donnell. Professor Richard Thaler, the Ralph and Dorothy Keller Distinguished Service Professor of Behavioral Science and Economics at the University of Chicago,<sup>4</sup> is an unpaid adviser to the Behavioural Insights Team.

## Moving from science to policy

“It turns out that the environmental effects on behaviour are a lot stronger than most people expect.”

Daniel Kahneman, Nobel Laureate,  
Economic Sciences<sup>5</sup>

This paper is informed by the growing body of research on what influences behaviour. One practical issue is that the sheer volume and technical language of the behavioural science literature over recent decades can present a significant barrier to the policy maker. For this reason, the Institute for Government, in partnership with the Cabinet Office, was commissioned to review this literature and draw together its key findings in an accessible form for professionals and policy makers. This led to the publication of the MINDSPACE report, which brings together the insights of behavioural science in a simple and practical check-list (see table on page 6). An explanation of the key elements of MINDSPACE and the behavioural science behind each of the examples in the paper is provided at the end of each section.

MINDSPACE	
<b>Messenger</b>	We are heavily influenced by who communicates information
<b>Incentives</b>	Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses
<b>Norms</b>	We are strongly influenced by what others do
<b>Defaults</b>	We 'go with the flow' of pre-set options
<b>Salience</b>	Our attention is drawn to what is novel and seems relevant to us
<b>Priming</b>	Our acts are often influenced by sub-conscious cues
<b>Affect</b>	Our emotional associations can powerfully shape our actions
<b>Commitment</b>	We seek to be consistent with our public promises, and reciprocate acts
<b>Ego</b>	We act in ways that make us feel better about ourselves

Behavioural science in an easy format: a summary of the main influences described in the MINDSPACE report (Cabinet Office and Institute for Government, 2010)<sup>6</sup>

The Behavioural Insights Team draws from this wide body of research and uses the MINDSPACE framework to support the work of those making decisions that impact upon the health and wellbeing of citizens. These decision makers are not limited to civil servants in Whitehall, but extend out to charities, businesses and local authorities.

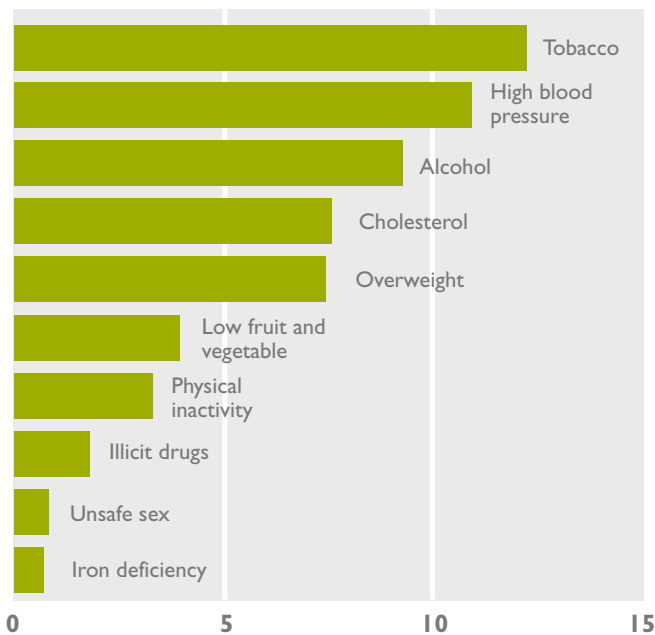
## Applying behavioural insight to health

“Behaviour change is the great challenge for health... The reforms we are bringing will empower you – the professionals – to commission services that work – to apply the best technology and the best new insights of social psychology and behavioural economics to achieve real improvements in public health.”

Secretary of State for Health Andrew Lansley, speech to Faculty of Public Health, July 2010

In the UK today, behavioural and lifestyle factors are thought to be major contributors in around half of all deaths. Most of these causes are well known, not just by professionals, but by the general public. They include smoking, unhealthy diet, excess alcohol consumption and inactive lifestyles. Some causes are less well known. For example, social isolation is associated with more than a doubling of the risk of many forms of mental illness, heart disease and early death.<sup>7</sup>

The lifestyle factors that impact upon people's health and wellbeing are often deeply entwined in the fabric of our everyday lives. In these areas, passing an Act of Parliament is unlikely to have the desired effect. Strong-armed regulation is not the answer to rebalancing our diets, changing our desire to drink too much alcohol on a Friday night, or making our lives more active.



Percentage of healthy years of life lost due to behavioural factors in wealthy nations (World Health Organization, 2002)

Focusing on the behaviours that cause illness is part of a broader change in the Government's approach, set out in the Public Health White Paper published in November 2010, which will fundamentally change our 'National Sick Service' to one that is more focused on preventing ill-health. The creation of a strong, local base for the promotion and commissioning of public health should also create the conditions for innovation and experimentation, pushing forward our understanding about what works, while opening the door to new delivery partners.

In short, we need to think about new and cost-effective ways of encouraging healthy behaviour, by addressing the causes of ill-health rather than seeking to cure the consequences of them.

## Who is this document for?

As reflected in the Public Health White Paper, the key players in the future will not be ministers and civil servants in Whitehall. In many cases, the key players will not be those in government at all, but local and national businesses, communities and charities. They will also be local authority public health professionals, GP commissioners, head teachers of schools, and other public sector professionals such as job centre staff. Generally, it will also be down to individuals too – smokers who want to quit, parents who would like their children to walk to school, adults who would like to eat and drink a little more healthily.

Of course, there is a role for central government too, not least in getting the overall framework right. Government also has a role in ensuring there is transparent health data and that, where relevant, government works with national businesses and other organisations to ensure that we all live up to our responsibilities in supporting healthy lifestyles – the Public Health Responsibility Deal is an example of this. Government may also have a role in supporting further research and the spreading of best practice, discussed briefly in the concluding section of this document.

In a world where general practitioners, public health professionals and local communities increasingly hold the budgets and power, we hope that some of the ideas contained here will spark interest well beyond Whitehall.

# 1. Smoking

More than a quarter of all deaths are smoking related<sup>1</sup>

There are currently 8.5 million adult smokers in the UK.<sup>2</sup> Smoking creates both psychological and physiological addiction, and though it is widely known that smoking is bad for you, smokers still tend to underestimate the risks to them personally.<sup>3</sup> All of these factors are important in understanding why it is so hard to quit.

We know that 65 per cent of smokers want to quit and the majority have unsuccessfully tried to give up in the last five years.<sup>4</sup> Increasing the success rate and frequency of smokers' quit attempts is a top public health priority.



## Designing an effective smoking cessation programme

There is an extensive evidence base for current tobacco control policy. Within this, there is evidence that people can respond to incentives to make a quit attempt and stick with it during the incentivised period.<sup>4</sup> This is particularly true if the incentives are relatively large. For example, smokers in the USA who were given \$750 over the course of a year were three times more likely than the control group to quit smoking.<sup>5</sup>

But evidence on incentives is very mixed and they have their downsides. We know that one-off incentives may condition us to maintain our behaviour only if we continue to be rewarded. The danger with time-limited trials is that after the incentives have stopped, the individual may begin smoking again. We also know that individuals will often respond more strongly to losing something they value than to being given a reward of equivalent value, and that incentives tend to be more effective at forming permanent habits if they reward us only sometimes.<sup>6</sup>

Another approach to encouraging positive behaviours is to use commitment devices.<sup>7</sup> The evidence from a range of studies suggests that people are more likely to respond in a positive way when they have entered into some kind of commitment with another individual or group, which could be in the form of a ceremony or signing a pledge in the presence of someone the individual in question trusts.



Building on this research, the Behavioural Insights Team has been examining a range of ways in which individuals might be encouraged to stop smoking by using loss aversion and commitment devices. Individuals who commit to quitting smoking in a way that they stand to lose something should they fail to achieve their objective, and who are not rewarded too frequently, are more likely to be successful. So, for example, quitters could be asked to sign a contract where they lose or keep rewards based on whether they pass regular smoking tests that prove they have not smoked. Successful ongoing commitment could be encouraged by introducing a regular lottery for people to win prizes.

**Thanks to a new collaboration between Boots, the Behavioural Insights Team and the Department of Health, Boots UK has committed to developing a smoking cessation trial that could launch in early 2011, seeking to encourage people to make more successful quit attempts. This trial will be designed using insights from behavioural science and medicine, and will build on the NHS-commissioned stop smoking services already provided in their stores. The Behavioural Insights Team will work in 2011 to extend these trials to other areas, should they prove successful.**



## MINDSPACE

### Ego, Incentives, Commitment and Salience

Evidence shows that smokers, despite knowing the damaging effects of smoking, tend to underestimate its negative impact on their own health.<sup>8</sup> This reflects a widespread 'attributional bias' that leads to most people overestimating the chances that good things will happen to them (such as winning the lottery) and underestimating the chances that bad things will happen. Such psychological defences make us feel better (**ego**), but they can also inhibit us from changing our behaviour.

It has also been found that when our behaviour and beliefs are in conflict – known as 'cognitive dissonance' – it is very often our beliefs that we change rather than our behaviour. Hence if we are undertaking a behaviour that we believe is dangerous, such as smoking, rather than correct the 'dissonance' by quitting, we instead adjust our beliefs about the danger.

In terms of successful programmes to encourage quitting, several effects are likely to be involved. First, small **incentives** can sometimes work better than medium to large incentives since these create a helpful dissonance – emphasising that the quitter is motivated not by the incentive itself, but by the intrinsic value of giving up smoking. Second, **commitments** where we promise to ourselves and others – particularly involving other people we care about – are known to be a powerful force in behaviour change. Third, the form of the incentives matters too: lotteries are a way of multiplying the impact of small financial incentives, and intermittent rewards can be more effective at maintaining change. Finally, there is a strong case for shaping the incentives around the profile of nicotine addiction and withdrawal, increasing the **salience** and profile of support and rewards in the critical period two or three days into the programme, when the negative effects of withdrawal are especially pronounced.

## 2. Organ donation

Every day three people on the organ transplant waiting list die<sup>1</sup>

### Increasing organ donation registration through prompted choice

There are more than 10,000 people on the waiting list for an organ transplant and every day three people on the waiting list die. Currently only 27 per cent of us are on the NHS Organ Donor Register, despite the fact that surveys consistently show that 65 per cent of us would be willing to donate an organ and 90 per cent of us are in favour of organ donation.<sup>2</sup>

England currently has an 'opt-in' system, whereby active consent is required to become an organ donor, instead of an 'opt-out' system, whereby consent is presumed. A review by the Organ Donation Taskforce in 2008 concluded that, although presumed consent may have the potential to increase donor rates, it would also have the potential to undermine the concept of donation as a gift and erode trust in NHS professionals. The Government has therefore concentrated on the Taskforce's recommendations to improve the infrastructure supporting organ

donation in England. While good progress has been made, with an increase in donor numbers of over 20 per cent since 2008, the Government is determined to explore all avenues for increasing donor rates still further.<sup>1</sup>

One such avenue is that of 'prompted choice', whereby a person is required to make a choice about if they would like to be an organ donor when completing, for example, a driving licence application form. Prompted choice has already been successfully applied to organ donation registration in several US states. Since 2008, Illinois has required that all driving licence applicants actively decide whether to register as a donor or not. The percentage of donors signed up to the register has increased from 38 per cent to 60 per cent as a result. At the start of the year, Texas also implemented such a system and donor registration rates have already doubled. Most recently California announced in October that it would introduce prompted choice to driving licence applications.<sup>3</sup>



Given the large percentage point difference between the number of individuals currently registered as organ donors in England and those who say that they would be willing to become donors, the Behavioural Insights Team considers that offering a prompted choice is likely to significantly increase the number of organ donor registrations.

**Thanks to a collaboration between the Behavioural Insights Team, Department of Health, NHS Blood and Transplant, Department for Transport and Driver and Vehicle Licensing Agency (DVLA), we can announce that a system of prompted choice will be trialled in England in 2011. This will be introduced to the DVLA online application form for renewing and applying for driving licences and if this approach proves to be as effective as evidence in the USA suggests, it can be extended to other registration routes.**

## MINDSPACE

### Saliency and Defaults

There are many things that we mean to do but never get around to. A major reason for this is that we live for today at the expense of tomorrow. This is known as 'hyperbolic discounting' and it refers to how people discount the future heavily compared with the present. So even though it may appear that there is little effort involved in signing the Organ Donor Register, this effort is immediate (**saliency**), whereas the gain is distant. Hence our good intentions never come to pass (see also Section 8 on physical activity).

Prompted choice has been found to be a highly successful approach to addressing the issue of discounting the future in a number of areas, and is based on the insights around the power of **defaults**. Changing the default options for pensions to a system of prompted choice has led to around 70 per cent of employees deciding to save more, versus around 40 per cent who opt into a pension scheme. This is lower than the 90 per cent who stay in an opt-out pension scheme – an even simpler default – but has the advantage of making the choice a conscious one. Another recent high-profile use of prompted choice resulted from the long legal battle between the EU and Microsoft, with the resolution being that instead of new PC users being automatically directed to using one particular browser, users are required to make a choice from a menu of five options.

## 3. Teenage pregnancy

Britain has the highest rate of teenage pregnancy in Western Europe<sup>1</sup>

Evidence shows that being pregnant young can lead to adverse effects in young people's lives – including low self-esteem, depression, poor relationships, reduced educational achievement and increased risk of social deprivation and adopting risky behaviours.<sup>2,3,4,5,6</sup>

### Teens and Toddlers

Teens and Toddlers is a UK charity which tackles teenage pregnancy in an unusual way. Teenagers take part in a 20-week programme where they mentor a toddler. Each week they spend time supervising and playing with a toddler at a nursery, experiencing first hand the demands and responsibilities of parenthood. This is then followed by sessions run by trained support workers who teach them about child development, parenting skills, sexuality and relationships. These sessions also provide a forum for the teenagers to discuss their experiences with each other.

Teens and Toddlers found that over a six-year period, the pregnancy rate of those who had participated in the programme was 2.7 per cent, in contrast to the national teenage average of 4.1 per cent. This lower rate was achieved in spite of the higher-risk teenagers that the programme targeted.<sup>7</sup> The Department for Education believes that this is a promising initiative, and as a result is supporting a randomised controlled trial to provide a robust assessment of the impact on teenage pregnancy rates.

The widespread practice by many schools when it comes to preventing teenage pregnancy is to bring in young teenage mothers to discourage pupils from following their lead. In many cases this will be ineffective or even counter-productive. In contrast, the Teens and Toddlers approach actively brings home the enormity of the responsibility of bringing

up a child, fosters emotional development and has been shown to change young people's behaviour.

**The Teens and Toddlers charity co-funds each of these initiatives, and so far it has been taken up by 26 local authorities, with over 6,000 teenagers taking part. Thanks to the reforms set out in the Public Health White Paper, power will be devolved to local authority public health professionals – giving them the freedom to innovate. This means that it will become much easier for local authorities to partner with charities like Teens and Toddlers, paving the way for this kind of innovative approach to become more widespread.**

### MINDSPACE

#### Norm, Messenger and Ego

Our behaviour is strongly influenced by what we see other people doing – called the 'declarative' or 'descriptive' social **norm**. For example, experiments have found that the proportion of people dropping a leaflet on the ground rose from 10 per cent to 40 per cent as the number of similar pieces of litter already on the ground rose from one to eight or more.<sup>8</sup> In short, we are heavily influenced by what other people are doing. These effects help to explain why sending a teenage mother into schools to discourage teenage parenthood is problematic (**messenger**). The challenge is made greater by what psychologists call the 'Romeo and Juliet' effect – the tendency, especially strong in young people, to actively react against being told what to do (**ego**). The elegance of approaches such as Teens and Toddlers is that they avoid the traps of reinforcing the wrong social norm or telling young people what to do, and instead catalyse the emotional development of the young person, while at the same time reducing teenage pregnancy.

## 4. Alcohol

Alcohol-related illness costs the NHS around £2.7 billion a year<sup>1</sup>

Alcohol costs the NHS around £2.7 billion a year and the cost of alcohol-related crime may be as high as £7.2 billion.<sup>1</sup> As a nation, we drink 345 million litres of alcohol a year.<sup>2</sup> A review of undergraduate drinking found that 52 per cent of male and 43 per cent of female students reported drinking above recommended levels. In comparison, figures for 16–24-year-olds in the general population are 37 per cent and 33 per cent respectively.<sup>3</sup>

### Reducing alcohol consumption in universities

We know that people are influenced by what they think other people are doing, even if the reality is different.<sup>4</sup> In the case of binge drinking, evidence has shown that students consistently overestimate how much alcohol their peers drink.<sup>5</sup> Recent trends suggest that excessive drinking patterns which begin during student years continue into adulthood, and so reducing alcohol consumption at this age is critical.

Several university campuses in the USA have used social norm campaigns in an effort to reduce heavy drinking. In 1994, the University of Arizona set out to correct the false perception of how much students' peers drank. Using posters, flyers and word of mouth, they communicated the real levels of drinking among students and as a result reduced the pressure to drink. Between 1995 and 1998, the campus experienced significant decreases in the rate of heavy drinking among undergraduate students.<sup>6</sup> However, evidence from other trials has been more

mixed, demonstrating the need to identify the specific behavioural influences involved.<sup>7</sup>

**In order to test the efficacy of initiatives aimed at reducing alcohol consumption, the Welsh Assembly Government and the charity Drinkaware are working together to develop and run a year-long pilot advertising campaign. This campaign will communicate accurate drinking levels to all university students in Wales. The pilot will start at the beginning of the next academic year.**

#### MINDSPACE

##### Norms and Salience

Work on alcohol shows the effects of social **norms** in action (specifically those called 'descriptive norms'). We generally do what we see or think others are doing, but an important twist is that our estimate of what other people are doing is often distorted. More specifically, we use various mental shortcuts or 'heuristics' to judge the frequency of a behaviour, and these shortcuts can sometimes mislead us. For example, we may estimate how frequent an event is by how readily we can call to mind an example (the 'availability heuristic'). Hence we are prone to thinking that flying is dangerous because we can easily call to mind an example of a plane crashing (**salience**).<sup>8</sup>

Similarly, one can see why students might overestimate the level of drinking among their fellow students. The loud noise of a small number of fellow students heading home drunk in the early hours is hard to ignore (**salience**), but the silent majority are much less visible. The availability heuristic leads us into thinking far more students drink to excess than actually do, and this can influence our behaviour.



## 5. Diet and weight

Six out of ten adults are overweight, costing the UK economy around £7 billion a year<sup>1</sup>

Six out of ten adults in the UK are overweight.<sup>1</sup> This costs the NHS around £4 billion a year and, because being overweight is associated with increased morbidity and more certified sick days, the total economic cost is £7 billion a year.<sup>1</sup> Overweight and obesity levels for children also remain disturbing, with nearly a quarter of all 4-year-olds and nearly a third of 10-year-olds overweight or obese.<sup>2</sup>

### Shopping trolley re-design in New Mexico, USA

The quality of our diet reflects levels of obesity. Most people know that they should eat more fruit and vegetables but in England 65 per cent of adults eat fewer than five portions of fruit and vegetables a day,<sup>3</sup> even though nutritional experts suggest that fruit and vegetables should make up about a third of the food we eat each day.<sup>4</sup>

A pilot experiment conducted by Collin Payne of New Mexico State University College of Business found that a simple line of yellow tape together with a sign placed across a shopping trolley could prompt shoppers to choose to buy more fruit and vegetables. The tape and sign designated one part of the trolley for fruit and vegetables and the other for all other purchases. By visually prompting people in this way, there was a large increase in the amount of fruit and vegetables purchased, without a decrease in profitability for the retailer.<sup>5</sup> Evidence suggests that making the trolley even more visually engaging by including an appealing picture of fresh fruit and vegetables is likely to make this even more effective.

**Visual prompts are already widely used by supermarkets and food manufacturers. But there is the potential for visual prompts to be introduced in more ways that help people make healthier food choices. Examples include experimenting with the design of trolleys and considering the order or height of healthier options on supermarket shelves. A recent example of this is the collaboration between Asda and the Department of Health's Change for Life campaign, whereby social norm messages were advertised on trolleys.<sup>6</sup> In the future, the Behavioural Insights Team will be reaching out to partners in the private, public and voluntary sectors to examine where trials of this kind might be most effective.**



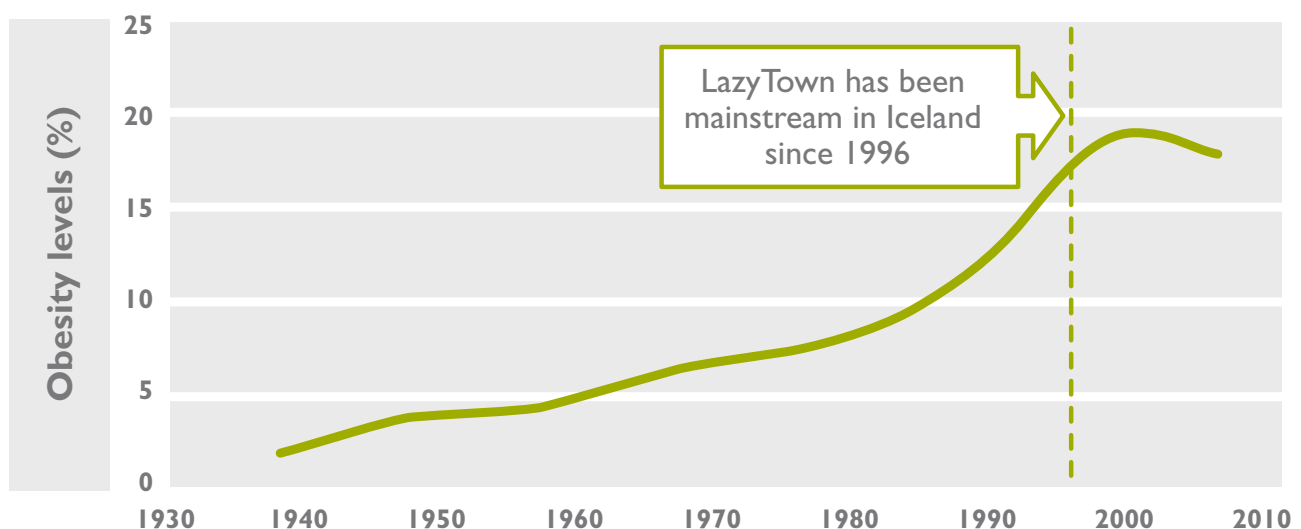


## Motivating children to be healthy in Iceland

LazyTown is an Icelandic TV and live show which is watched by children all over the world. Its healthy superhero Sportacus motivates children to eat healthily and be active. In Iceland, several LazyTown initiatives have been run in partnership with the Government and private sector. For instance, children between 4 and 7 years old were sent an 'Energy Contract' that they signed with their parents, in which they were rewarded for eating healthily, going to bed early and being active. In one supermarket chain, all the fruit and vegetables were branded 'Sports Candy' – LazyTown's name for fruit and vegetables – leading to a 22 per cent increase in sales.<sup>7</sup> Since LazyTown became mainstream in 1996, Iceland's child obesity levels have started falling – one of the few places in the world to show such a trend (see graph).<sup>8</sup>

**There is much that local authorities, supermarket chains and those with a role in public health might learn from the Icelandic initiatives. In order to test whether these will have a similar impact in the UK, the Behavioural Insights Team and the Department of Health have now established a partnership with LazyTown. This national initiative will be developed using behavioural science insights and will involve partnering with nurseries up and down the country. Coordinated at a national level, local health professionals will also have a crucial role in delivering this initiative, and this relationship will be indicative of the devolved principles of the newly created Public Health England. The Behavioural Insights Team will continue to play a role in helping to facilitate new and innovative initiatives of this kind.**

### Obesity among 9-year-old children in Iceland



## Empowering people to make healthier choices by providing more information

Advocates have argued for a number of years for clearer labelling of the calorific and nutritional content of foods. Indeed, Secretary of State for Health Andrew Lansley has said he wants to go further on getting restaurants, takeaways, fast food outlets and others to provide calorie information. In ways like this, people can be empowered to make a healthier choice through the provision of relevant information.

Research from behavioural science suggests that the key to communicating information effectively is to do it in relevant and engaging ways. Soon-to-be published research suggests that well-designed labels can reduce the calorific levels of a snack chosen by around 20 per cent, especially when done so in relevant and engaging ways.<sup>9</sup>

However, critics rightly point out that even the most 'unhealthy' of items can be perfectly healthy when part of a balanced diet. This suggests a strong case for giving consumers a more holistic account of their diet against which they can make choices. Bringing together ideas of transparency, behavioural economics and the capabilities of today's technology and store cards, many potentially powerful possibilities exist.

**The Department of Health's Public Responsibility Deal team is currently working to secure voluntary agreements from the food industry to commit to out-of-home food labelling in 2011. Evidence suggests that consumer behaviour might also be positively stimulated by food retailers in other ways, such as offering customers three-month summaries of the nutritional profile of the food that they buy, set against a healthy average.**

### MINDSPACE

#### Priming, Salience and Affect

The ideas in this section illustrate a number of behavioural effects. Several illustrate the power of **priming** and **salience** – such as priming shoppers to think about buying healthy food. People show a strong tendency to anchor to an object or a number that we are primed with, such as how much fruit to eat. For example, if people are asked: "How many countries are there in Africa? Is it, for example, x?" their answer is strongly anchored to the arbitrary number that is mentioned, even when they are specifically told that this is not the right answer. These 'anchoring' effects are particularly relevant in relation to the yellow tape on the supermarket trolley, but also to the well-known campaign to eat '5 a day' for fruit and vegetables.<sup>10</sup>

Finally, we might note that diet is an area where short-term emotional responses tend to overpower longer-term, more 'rational' thinking (**affect**). In a study, where workers were offered a prize next week of fruit or chocolate, 74 per cent chose fruit. But when the delivery van arrived on the day and said they had 'lost' the form and again asked what the person wanted, around 70 per cent claimed to have chosen chocolate. In other words, there are various opportunities for products and services that allow people to pre-commit to healthier options.<sup>11</sup>



## 6. Diabetes

2,940 diabetic children in the UK are admitted to hospital every year as a result of failing to keep their blood sugar levels under control<sup>1</sup>

From 1996–2005 the proportion of people with diabetes in Britain rose from 2.8 per cent to 4.3 per cent.<sup>2</sup> Of those, just over 21,000 under-17s have type 1 diabetes.<sup>3</sup> Managing diabetes requires regular monitoring of blood sugar levels and this consistent, regular monitoring can prove especially challenging for children and their parents.

### Bayer's Nintendo Didget device makes blood-sugar testing fun and rewarding for children

A collaboration between Bayer Healthcare and Nintendo DS has led to the development of a Didget device which gives points to diabetic children in return for them consistently consenting to regular pin-prick blood-sugar tests. These points can be used on Nintendo games or in the Didget web community, where children can compare their performance against others. This device shows how using fun, innovative products can have very practical effects on people's health and wellbeing.<sup>4</sup>

**Developers of other non-health technologies may also have cost-effective ideas that local authorities and GP commissioning consortia may wish to trial or, if appropriate, prescribe.**

### MINDSPACE

#### Incentives and Salience

As is often the case, blood testing for diabetes juxtaposes short-term pain – literally in this case – for a long-term gain (**incentives**). This is a problem that most adults struggle with, but which children may find even more difficult. One option is to try to make the long-term gain (or avoidance of loss) clearer, but an alternative is simply to create an immediate gain (**salience**). In this case, the Nintendo game introduces an element of fun even before the discomfort of the test, so the pain is being discounted too. Of course, the game itself helps to distract attention from the discomfort of the test, and since the game continues after the test, the pain looms smaller in the memory. This relates to what are called 'primacy and recency effects' – we remember most clearly the first and the last part of an experience.<sup>5</sup>



## 7. Food hygiene

There are over a million cases of food poisoning a year in the UK, costing the NHS and business £1.5 billion a year<sup>1</sup>

Of the million plus cases of food poisoning a year in the UK, 20,000 people are hospitalised and 500 die. Food Standards Agency research has found that people primarily judge hygiene standards of food outlets on the appearance of an establishment (68 per cent), appearance of staff (44 per cent), cleanliness of toilets (33 per cent) and word of mouth (22 per cent).

### The new Food Hygiene Rating Scheme

Up until now, people have had to make judgements on the hygiene of restaurants and food outlets based on appearance and hearsay alone. This is now set to change, with the recent launch of the National Food Hygiene Rating Scheme by the Food Standards Agency, in partnership with local authorities. The aim of this scheme is to empower customers to make

more informed decisions when it comes to the hygiene standards of food premises.

This national scheme, building on a number of local authority-led pilots, will enable people to view simply summarised hygiene information online and on stickers voluntarily posted on the entrance door or window of restaurants and food outlets. The ratings range from 5 (very good) to 0 (urgent improvement

necessary). Evaluation of the pilot schemes found that 7 in every 10 customers are unlikely to enter a restaurant rated below the midpoint in the scale.<sup>2</sup> Schemes similar to this one have already worked successfully in both Denmark and California. In Denmark, there was an increase in good hygiene scores from 70 per cent to 86 per cent since the scheme launched in 2002,<sup>3</sup> and in California there was a 13 per cent drop in food-borne disease hospitalisations.<sup>4</sup>

**The National Food Hygiene Rating Scheme was launched in November 2010 and the Behavioural Insights Team will be working with the Food Standards Agency to make the information generated by the scheme as widespread and accessible as possible. One option is to encourage respected restaurant reviewers and organisations such as Time Out, Top Table and the Good Food Guide to rank restaurants on their hygiene standards as well as the quality of food, service and atmosphere – which will be possible for the first time due to the availability of this information.**

### MINDSPACE

#### Salience

Evidence suggests that when information is made public and **salient**, such as the hygiene standards of a restaurant, this exposure will motivate that restaurant to improve their standards. Exposing potential customers to this kind of hygiene information, particularly when they are booking and made aware of this information in advance before they are in a hungry, or 'hot', state, can dramatically change their choices and in so doing strongly drive hygiene improvements without the need for further regulation.



## 8. Physical activity

If people who engage in low levels of physical activity were more active, we could save more than £900 million a year<sup>1</sup>

If recommended levels of activity were met, 1 in 10 premature deaths could be prevented.<sup>2</sup> Over the last century, the number of people employed in inactive professional or managerial roles has more than doubled, while the proportion of people employed in active, skilled or unskilled jobs has decreased by two-thirds. A key challenge for improving physical fitness is tackling our increasingly inactive lifestyles at work and play: sitting on public transport rather than walking, using escalators rather than stairs, playing video games and watching television rather than playing sports.<sup>3</sup> Most people are aware of the health benefits of taking the stairs instead of the escalator, but when faced with the choice, we usually take the easy option – particularly when others are doing the same.

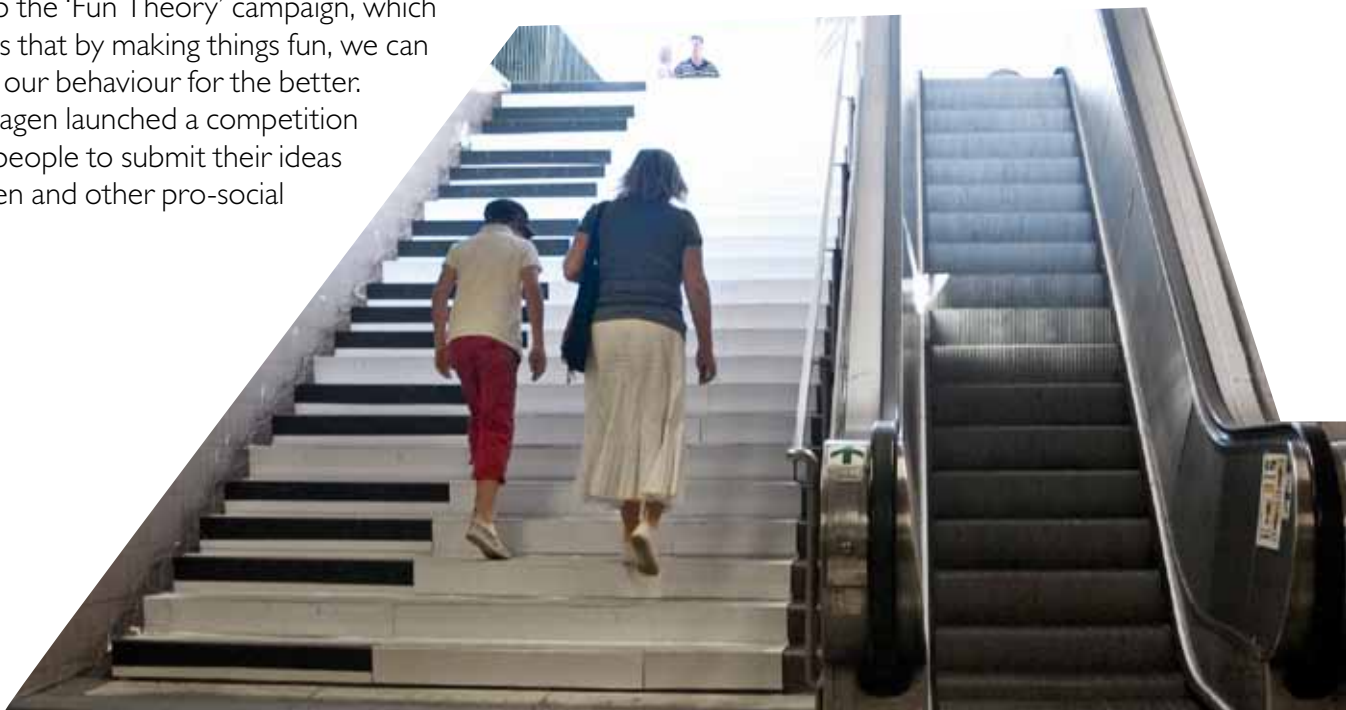
### The piano stairs in Stockholm

Volkswagen has been working in Sweden to develop the 'Fun Theory' campaign, which predicts that by making things fun, we can change our behaviour for the better. Volkswagen launched a competition asking people to submit their ideas for green and other pro-social

innovations. Over 700 ideas from more than 200 countries were submitted, all of which were judged by a panel of Swedish experts in behavioural science and the environment.

The piano stairs was one of the most popular ideas. For one day in a Stockholm metro station, Volkswagen installed motion-sensor piano keys so that musical tunes were played as people climbed the stairs. A before-and-after study showed that 66 per cent more people than normal took the stairs rather than the escalator. Making the stairs eye-catching and fun to climb had a motivating effect. In addition, once more people started taking the stairs, others tended to follow.<sup>4,5,6</sup>

**This was just a one-day trial and so we do not know the long-term effects of such an intervention. However, trials such as this do demonstrate that there are creative ways to encourage people to choose the more active option. These insights can be applied to many areas beyond tube and railway stations – for example, architects and town planners play a key role in designing more active environments, whether through the layout of parks or the positioning of stairs (relative to lifts) in a building.**



## Nike's GPS iPhone app and 'Grid'

As detailed in the recent Public Health White Paper, when it comes to running, Nike has been turning its attention to motivational tools. They have recently launched the Nike+ GPS iPhone app, which allows you to track your run, receiving live updates as you go. The app also informs the user how fast they are running and delivers motivational messages from famous athletes such as Paula Radcliffe and Lance Armstrong.

'The Grid' is another innovative initiative that turns running into a game.<sup>7</sup> Phone boxes in London have been branded, identifying themselves as visual markers for people to run from one to the next, typing in their personal ID number as they go. It is a competition to be the fastest to find all the phone boxes, and scores are uploaded automatically to the Grid website where runners can compare their scores against those of others.



Nike has put both of these tools to good use when it comes to its youth running projects in the UK. Partnering with Charlie Dark – a teacher, writer and DJ – they organise weekly running groups (called 'Run Dem Crew Youngers')<sup>8</sup> where they combine creative workshops with runs. Charlie uses the Nike+ app on his iPhone to give regular feedback to the young people, and they have used the Grid game to create a competition between 11 running groups across the country.

**There is potential for these kinds of tools and ideas to be used at a local level, perhaps creating group running clubs set up in partnership with public health professionals, community organisations and local sports clubs.**

## Incentivising pupils to walk to school

As highlighted in the Public Health White Paper, Transport for London's and Intelligent Health's 'Step2Get' initiative combines swipe card technology, online gaming and rewards to incentivise pupils to walk to school. So far it has been piloted in two London secondary schools, where pupils were given a card to swipe machines placed on lamp-posts along a route to school. The more miles they walked, the more points they earned, which could then be redeemed for rewards that included cinema tickets and Topshop vouchers. They could then track their progress online and also compare it with that of other classes.

A third of all pupils signed up to Step2Get, and this not only increased the number of children walking to school by 18 per cent, but resulted in more of them getting to class on time. Also, as a result of the visibility of the lamp-post swipe machines and seeing others walking to school, a new social norm was created.



Next year, this initiative is going transatlantic and approximately 30,000 pupils from London and New York will be competing with each other to walk the most miles. The winning city of the 'International Walk to School Challenge' will be announced during the 2012 Olympic Games.<sup>9</sup>

**Could local authorities and schools work with providers such as Intelligent Health to expand a scheme like this beyond London? The health and related cost savings have been shown to be significant – notably the reduction in rush-hour congestion. Whether you use lamp-posts or phone boxes as your markers, these prove useful devices for motivating people to be more active.**

## Combining video gaming with exercise

Whereas children used to go out to play, more of their time is now spent on inactive pursuits such as watching television and playing computer games. Computer games are here to stay, with average weekly gaming time averaging 12.2 hours a week. However, recent technological developments have led to game consoles such as the Nintendo Wii requiring players to use body movements to control on-screen action – thus increasing the opportunities for physical activity.

Studies by Liverpool John Moores University found that, compared with video gaming, active gaming on the Wii significantly increased total body and upper limb movement in adolescent boys and girls. This was a result of participants being on their feet and using wireless handheld remotes to play the games, with the associated increases in energy expenditure and heart rate significantly greater than sedentary gaming. The studies found that, when using the Wii console, the participants' energy expenditure increased 156 per cent above resting. Based on the average gaming week of 12.2 hours, this translates to a potential 1,830 calories burned per week when using the Wii.<sup>10,11</sup>

With more motion-controlled gaming consoles entering the market (such as Kinect for Xbox 360 or Move for PlayStation 3) and the huge popularity of the games played on these platforms (Wii Sports Resort was the second most popular video game in the world in 2009), the potential to shift to more physically active gaming is significant.<sup>12</sup>

**With this knowledge, parents can be empowered to make healthier choices when it comes to which computer consoles and games they buy for their children.**

## Changing the social norm around cycling

The introduction of bike hire schemes in major cities across the world offers a fascinating test of conventional versus behavioural economics. In conventional economics, it would be expected that introducing a large number of relatively cheap and easy-to-hire bikes would make it less likely that people would buy a bike themselves. In contrast, behavioural economics suggests that the effect would go the other way – that seeing more people cycle would create a new social norm and visual prompt, encouraging more people to want to cycle. The answer? Bike retailers have reported significant increases in bike sales since the advent of London's bike hire scheme.

**This is an interesting lesson for other cities considering taking up similar schemes. Also, if the cycling stations and bikes themselves act as such a positive visible cue, perhaps their presence could be made even more prominent in future schemes.**



## MINDSPACE

### Norms, Affect and Salience

There is ongoing academic debate about the exact causal relationship between exercise, diet and weight, and specifically around how much exercise is a cause or effect on changes in weight. We certainly know that individual differences in weight are strongly and causally linked to levels of movement, but there has also been growing study of how obesity (and exercise) appears to spread through social networks (**norms**), as most famously illustrated by the long-term, cross-generational Framingham Health Study in the USA.<sup>13</sup>

Like other lifestyle habits, exercise is strongly affected by our tendency to discount future gains, such as being fit and feeling good, relative to short-term pains. The Harvard economist, David Laibson, often uses the specific example of exercise to illustrate our deeply ingrained tendency to procrastinate. Exercising today involves immediate sweat and effort, with the benefits being realised in the long term – we are therefore less inclined to exercise as much as we should. By contrast, the idea of exercising tomorrow looks very attractive. Hence we intend, quite sincerely, always to exercise tomorrow.<sup>14</sup>

The examples in this section seek to turn this problem around, such as through adding an immediate pleasure up front with the fun of the piano stairs (**affect** and **salience**), or by changing the social norm around exercise with the city bike hire scheme.<sup>15</sup>

## 9. Social care

Social care for the elderly costs government more than £16 billion each year<sup>1</sup>

The UK population is expected to increase to 67 million by 2020.<sup>2</sup> The number of those aged over 85 will increase by 50 per cent by 2020.<sup>2</sup> Increases in life expectancy will mean greater numbers of people with greater health and care needs. Demand for informal care from family, friends and community members is projected to rise by 40 per cent by 2022, particularly affecting those without children and those who do not have relatives living close by.<sup>3</sup>

Despite the significant contribution of informal care to support friends and family, we know that there is sizeable unmet need for social care in the current system. This unmet need will grow rapidly

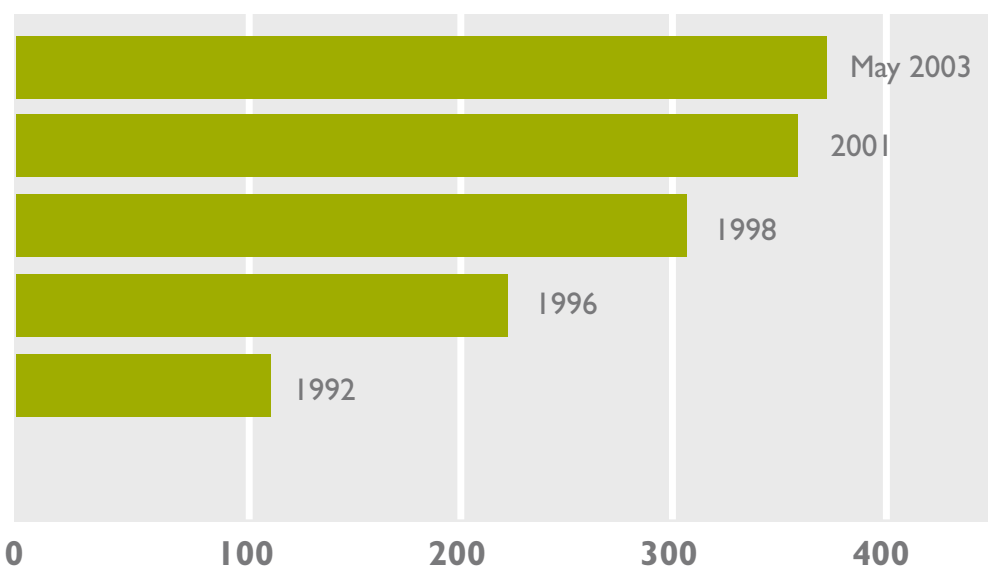
as demand increases – there will be a projected 1.6 million more adults in England over the age of 18 with a care need by 2026 (a 30 per cent increase).<sup>4</sup>

### A social care credits scheme

Enabling people to help one another, by unlocking currently under-utilised time and skills, will be crucial to ensuring that older people can live a happy and independent lifestyle for as long as possible.

The 'Fureai Kippu' scheme has been developed in Japan over the past 15 years, and is a powerful example of an alternative approach to social care. The unit of care (the 'Fureai Kippu') is an hour of time earned for individuals who help older people with any aspects of their care that the national healthcare system does not cover: for

### Growth of the number of Fureai Kippu branches



Source: Lietaer B (2004) Complementary currencies in Japan today: Their history, originality and relevance. *International Journal of Community Currency Research* 8:1–23.

example help with shopping or food preparation, or with the daily bath (a ritual in Japan). These Fureai Kippu can be saved for the individual's own use in the future, or transferred to someone of their choice, typically a parent or family member who lives elsewhere in the country and who needs similar help. There are now more than 400 Fureai Kippu branches in Japan, involving tens of thousands of active participants.<sup>5</sup>

Because the elderly participating in this scheme now have a support system at their own home, the time when they have to be moved to expensive retirement homes can be significantly postponed, and the period they are spending in hospitals after a medical problem can also be much shorter. All this reduces the costs to society of elderly care, while improving the subjective quality of life of the elderly themselves.<sup>6,7</sup>

**Drawing on these insights, the Behavioural Insights Team, together with the Department of Health, the Department for Work and Pensions and the Department for Communities and Local Government, is working with the Royal Borough of Windsor and Maidenhead – one of the four Big Society ‘vanguard communities’ announced by the Prime Minister in July 2010 – to develop a reciprocal time-credit scheme to help catalyse more peer-to-peer provision of social care. The Royal Borough will be designing and testing the feasibility of a local ‘CareBank’ model, which enables all**

**residents to gain time-credits in return for voluntary activity in support of older people. The project will be co-designed with the local community to develop exchange mechanisms and incentive schemes that maximise opportunities for everybody to participate as both givers and receivers. If successful, it is hoped that localities in other parts of the country would develop their own social care time-credit and, with an effective nation-wide exchange platform, people could start to trade credits across different localities.**

## MINDSPACE

### Commitment

A series of studies has shown the remarkable relationship between social connection or isolation and ill-health. In longitudinal studies, social isolation has been found to be associated with two- to five-fold increases in age-adjusted mortality rates, particularly in men.<sup>8</sup> Social isolation has also been found to decrease survival rates after the onset of a condition, reduce post-operative survival rates, and even – under experimental conditions – increase susceptibility to specific viruses, such as the common cold.<sup>9</sup>

The causal pathways for these effects are increasingly well understood. They include not only the direct effects of caring support – making sure that we are fed and warm – but also demonstrable positive effects on the immune system that seem to result from confiding in others.<sup>10</sup>

The care credit scheme described rests heavily on the power of reciprocity and **commitment** – our desire to help others who have helped us.





# Conclusion

There is no reason why we cannot succeed in tackling today's rising tide of chronic lifestyle-related diseases. Some trends are already encouraging, such as the overall falls in smoking rates (though there are still rises in some key groups). Other trends are more worrying, such as rising levels of children who are overweight.

In most cases, success will not come from a single 'silver bullet'. Instead it will come from a combined approach between many partners – local communities, professionals, businesses and citizens themselves.

A key objective of the coming years will be to try out behavioural approaches – to experiment at local level – to find the most effective ways of adjusting our lifestyles in ways that keep or put citizens in the driving seat and make it easy to live a happy and healthy life. The current state of our

knowledge – about both health and behavioural science – gives us many powerful clues about what is likely to work, but there is a great deal that we do not know. In such cases, we must ensure we test new approaches in a robust way – preferably with randomised control trials and before and after measures – supported with evaluations that will help other areas learn the lessons. In recognition of this need, a new Policy Research Unit on Behaviour and Health was announced in the recent Public Health White Paper.

It is clear to us from our work with the Department of Health, health professionals and businesses that there is a great deal of energy and enthusiasm for the new health agenda. If we can combine the insights from behavioural science with this enthusiasm and professional expertise, the benefits are likely to be very substantial indeed – fewer lives lost, better value for money and better health.

## Designing in experimentation

Though behavioural science gives us a good starting point for how communities and citizens can improve health, there is a strong case for trying and testing variations in approach.

When you use many well-known websites or browsers, the page you are directed to is often one of two or more versions, varying slightly in wording or position. This enables the site's designers to see whether any of the variations work significantly better. This approach, sometimes known as A-B testing, enables a constant process of innovation and learning, but is very rarely used in the public sector. Public health professionals can learn much from these types of careful experimentation, such as which kinds of link or information from a public website lead to more attempts to quit smoking or joining the organ donation register.

The same applies for other kinds of approaches to encourage healthy behaviour. Even within the examples presented in this paper, there are many possible variations in approach. For example, there are many different combinations of the schemes to help smokers quit, to encourage more active lifestyles, or to improve diets. The fact is we generally cannot know in advance which combination will work best. But we can easily find out. We – local communities, citizens, public health professionals – can try out alternative combinations. What we must do is ensure that such trials are framed in a robust way – preferably with randomised control trials and before and after measures – supported with evaluations that will help other areas learn the lessons, and with transparency of results so that others can study and learn from what happened.

# References and useful links

## Introduction

1. HM Government (2010) *The Coalition: Our Programme for Government*. London: HM Government.
2. Department of Health (2010) *Healthy Lives, Healthy People: Our Strategy for Public Health in England*. London: Department of Health.
3. Cialdini R (2003) Crafting normative messages to protect the environment. *Current Directions in Psychological Science* 12(4): 105–109.
4. Thaler RH and Sunstein CR (2008) *Nudge: Improving Decisions about Health, Wealth and Happiness*. New Haven CT: Yale University Press.
5. Kahneman D (2008) Two big things happening in psychology today. *Edge*.
6. Cabinet Office and Institute for Government (2010) *MINDSPACE. Influencing Behaviour through Public Policy*. London: Cabinet Office.
7. Halpern D (2005) *Social Capital*. Cambridge: Polity Press.

## Smoking

1. Peto R, Lopez AD, Boreham J and Thun M (2006) *Mortality from Smoking in Developed Countries 1950–2000*. Clinical Trial Service Unit and Epidemiological Studies Unit, Oxford University: [www.ctsu.ox.ac.uk/~tobacco](http://www.ctsu.ox.ac.uk/~tobacco)
2. Robinson S and Bugler C (2008) Smoking and drinking among adults. *General Lifestyle Survey 2008*. Newport: Office for National Statistics.
3. Weinstein D, Marcus S and Moser R (2005) Smokers' unrealistic optimism about their risk. *Tobacco Control* 14(1): 55–59.
4. Cahill K and Perera R (2009) Competitions and incentives for smoking cessation. *Cochrane Collaboration*.
5. Volpp K et al. (2009) A randomised controlled trial of financial incentives for smoking cessation. *New England Journal of Medicine* 360(7): 699–709.
6. Cabinet Office and Institute for Government (2010) *MINDSPACE. Influencing Behaviour through Public Policy*. London: Cabinet Office.
7. Giné X, Karlan D and Zinman J (2010) Put your money where your butt is: a commitment contract for smoking cessation. *American Economic Journal – Applied Economics* 2(4): 213–235.
8. Weinstein N (1987) Unrealistic optimism about susceptibility to health problems: Conclusions from a community-wide sample. *Journal of Behavioral Medicine* 10(5): 481–500.

See also NHS Choices, Smokefree: <http://smokefree.nhs.uk/>

## Organ donation

1. Department of Health (2008) *Organs for Transplants: A Report from the Organ Donation Taskforce*. London: Department of Health.
2. Department of Health (2008) *The Potential Impact of an Opt Out System for Organ Donation in the UK: An Independent Report from the Organ Donation Taskforce*. London: Department of Health.
3. Abadie A and Gay S (2006) The impact of presumed consent legislation on cadaveric organ donation: A cross-country study. *Journal of Health Economics* 25(4): 599–620.

See also NHS Blood and Transplant: [www.uktransplant.org.uk](http://www.uktransplant.org.uk)

## Teenage pregnancy

1. Office for National Statistics (2009) *Social Trends 38*. London: Office for National Statistics.
2. Grimm KJ (2007) Multivariate longitudinal methods for studying developmental relationships between depression and academic achievement. *International Journal of Behavioral Development* 31(4): 328–339.
3. Harden A, Brunton G, Fletcher A and Oakley A (2009) Teenage pregnancy and social disadvantage: Systematic review integrating controlled trials and qualitative studies. *British Medical Journal* 339: b4254.
4. Jordahl T and Lohman B (2009) A bioecological analysis of risk and protective factors associated with early sexual intercourse of young adolescents. *Children and Youth Services Review* 31(12): 1272–1282.
5. Meier AM (2007) Adolescent first sex and subsequent mental health. *American Journal of Sociology* 112: 1811–1847.
6. Thornberry TP (1987) Toward an interactional theory of delinquency. *Criminology* 25: 863–891.
7. McDowell A (2004) *A Retrospective Analysis of the Efficacy of the Teens and Toddlers Programme*. London: Children Our Ultimate Investment UK.
8. Cialdini RB, Reno RR and Kallgren CA (1990) A focus theory of normative conduct: Recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology* 58(6): 1015–1026.

See also Teens and Toddlers: [www.teensandtoddlers.org](http://www.teensandtoddlers.org)

## Alcohol

1. Department of Health (2010) *Healthy Lives, Healthy People: Our Strategy for Public Health in England*. London: Department of Health.
2. Rickards L, Fox K, Roberts C et al. (2004) *Living in Britain: Results from the 2002 General Household Survey*. London: Office for National Statistics.

3. Gill JS (2002) Reported levels of alcohol consumption and binge drinking within the UK undergraduate student population over the last 25 years. *Alcohol and Alcoholism* 37(2): 109–120.
4. Thaler RH and Sunstein CR (2008) *Nudge: Improving Decisions about Health, Wealth and Happiness*. New Haven CT: Yale University Press.
5. Bellis MA, Hughes K, Cook PA and Morleo M (2009) *Off Measure: How We Underestimate the Amount We Drink*. London: Alcohol Concern.
6. Johannessen K and Glider P (2003) The University of Arizona's Campus Health social norms media campaign. In Perkins HW (ed.) *The Social Norms Approach to Preventing School and College Age Substance Abuse: A Handbook for Educators, Counselors, and Clinicians*. San Francisco: Jossey-Bass.
7. Moreira T, Smith LA and Foxcroft DR (2009) Social norms interventions to reduce alcohol misuse in university or college students. *Cochrane Database of Systematic Reviews* 3: CD006748.
8. Tversky A and Kahneman D (1973) Availability: A heuristic for judging frequency and probability. *Cognitive Psychology* 5(2): 207–232.

See also DrinkAware: [www.drinkaware.co.uk](http://www.drinkaware.co.uk)

## Diet and weight

1. Government Office for Science (2007) *Foresight – Tackling Obesities: Future Choices – Modelling Future Trends in Obesity and the Impact on Health*, second edition. London: Department for Innovation, Universities and Skills.
2. National Statistics and NHS Information Centre (2009) *National Child Measurement Programme: England, 2008/09 School Year*. London: NHS Information Centre.
3. Bates B, Lennox A and Swan G (2010) *National Diet and Nutrition Survey. Headline Results from Year 1 of the Rolling Programme (2008–09)*. London: Food Standards Agency and Department of Health.
4. Lock K, Pomerleau J, Causer L et al. (2005) The global burden of disease attributable to low consumption of fruit and vegetables: Implications for the global strategy on diet. *Bulletin of the World Health Organization* 83: 100–108.
5. Payne C (2010) Personal communication. New Mexico State University College of Business.
6. Change4Life: [www.nhs.uk/change4life](http://www.nhs.uk/change4life)
7. LazyTown: [www.lazytown.biz](http://www.lazytown.biz)
8. LazyTown presentation to Cabinet Office, 2010.
9. Loewenstein G et al: forthcoming.

10. Thaler RH and Sunstein CR (2008) *Nudge: Improving Decisions about Health, Wealth and Happiness*. New Haven CT: Yale University Press.
11. Read D and van Leeuwen B (1998) Predicting hunger: The effects of appetite and delay on choice. *Organizational Behavior and Human Decision Processes* 76(2): 189–205.

## Diabetes

1. Edge JA, Jakes RW, Roy Y et al. (2006) The UK case-control study of cerebral oedema complicating diabetic ketoacidosis in children. *Diabetologia* 49(9): 2002–2009.
2. Masso Gonzalez EL, Johansson S, Wallander M-A and Garcia Rodrigues LA (2009) Trends in the prevalence and incidence of diabetes in the UK: 1996–2005. *Journal of Epidemiology and Community Health* 63(4): 332–336.
3. Diabetes UK (2010) *Diabetes in the UK 2010: Key Statistics on Diabetes*. London: Diabetes UK.
4. Bayer Didget: [www.bayerdidget.co.uk](http://www.bayerdidget.co.uk)
5. Deese J and Kaufman RA (1957) Serial effects in recall of unorganized and sequentially organized verbal material. *Journal of Experimental Psychology* 54(3): 180–187.

## Food hygiene

1. Food Standards Agency (2009) *Annual Report of the Chief Scientist 2008*. London: Food Standards Agency.
2. Food Standards Agency National Food Hygiene Rating Scheme: [www.food.gov.uk/news/newsarchive/2010/nov/fhrslaunch](http://www.food.gov.uk/news/newsarchive/2010/nov/fhrslaunch)
3. Data from the Danish Ministry of Food, Agriculture and Fisheries.
4. Simon PA, Leslie P, Run G et al. (2005) Impact of restaurant hygiene grade cards on foodborne-disease hospitalizations in Los Angeles County. *Journal of Environmental Health* 67(7): 32–36.

## Physical activity

1. Britton A and McPherson K (2000) *Monitoring the Progress of the 2010 Target for Coronary Heart Disease Mortality: Estimated Consequences on CHD Incidence and Mortality from Changing Prevalence of Risk Factors*. London: National Heart Forum.
2. World Health Organization (European Region) data: [www.euro.who.int](http://www.euro.who.int)
3. Department of Health (2009) *Be Active, Be Healthy: A Plan to Get the Nation Moving*. London: Department of Health.
4. [www.rolighetsteorin.se](http://www.rolighetsteorin.se)
5. [www.youtube.com/watch?v=ivg56TX9kWI](http://www.youtube.com/watch?v=ivg56TX9kWI)

6. [www.thefuntheory.com](http://www.thefuntheory.com)
7. Nike Grid: [www.nikegrid.com](http://www.nikegrid.com)
8. Nike Run Dem Crew Youngers: [www.rundemcrew.com/rdc-youngers/](http://www.rundemcrew.com/rdc-youngers/)
9. Step2Get and International Walk to School Challenge: [www.intelligenthealth.co.uk](http://www.intelligenthealth.co.uk)
10. Graves L, Stratton G, Ridgers ND and Cable NT (2007) Energy expenditure in adolescents playing new generation computer games. *British Journal of Sports Medicine* 42(7): 592–594.
11. Graves L, Ridgers ND and Stratton G (2008) The contribution of upper limb and total body movement to adolescents' energy expenditure whilst playing Nintendo Wii. *European Journal of Applied Physiology* 104(4): 617–623.
12. NPD Group, GfK Chart-Track Ltd and Enterbrain Inc (2010) *The Top Global Markets Report*.
13. Christakis NA and Fowler JH (2007) The spread of obesity in a large social network over 32 years. *New England Journal of Medicine* 357(4): 370–379.
14. Laibson D (1998) Self control and saving for retirement. *Brookings Papers on Economic Activity* 1: 91–172.

See also London Cycle Hire: [www.tfl.gov.uk/barclayscyclehire](http://www.tfl.gov.uk/barclayscyclehire)

## Social care

1. Featherstone H and Whitham L (2010) *Careless: Funding Long-term Care for the Elderly*. London: Policy Exchange.
2. Office for National Statistics (2007) 2006 Based Projections.
3. Botsman R and Rogers R (2010) *What's Mine is Yours: The Rise of Collaborative Consumption*. New York: HarperCollins.
4. Department for Communities and Local Government (2010) Local Authority Resource Account.
5. Lietaer B (2004) Complementary currencies in Japan today: History, originality and relevance. *International Journal of Community Currency Research* 8: 1–23.
6. Cacioppo JT and Patrick W (2008) *Loneliness: Human Nature and the Need for Social Connection*. New York: Norton and Co.
7. Halpern D (2010) *The Hidden Wealth of Nations*. Cambridge: Polity Press.
8. Berkman L (1983) The assessment of social networks and social support in the elderly. *Journal of the American Geriatrics Society* 31(12): 743–749.
9. Cohen S, Doyle W, Skoner D et al. (1997) Social ties and susceptibility to the common cold. *Journal of the American Medical Association* 277 (24): 1940–1944.
10. Kiecolt-Glaser JK, Fisher LD, Ogrocki P et al. (1987) Marital quality, marital disruption, and immune function. *Psychosomatic Medicine* 49(1): 13–34.



**CabinetOffice**

Behavioural Insights Team

**This is a discussion paper. Its purpose is to encourage public debate.**

Published by the Cabinet Office Behavioural Insights Team

Publication date: December 2010

© Crown copyright 2010

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence.

To view this licence, visit [www.nationalarchives.gov.uk/doc/open-government-licence/](http://www.nationalarchives.gov.uk/doc/open-government-licence/) or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or e-mail: [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk)

Any enquiries regarding this document should be sent to us at: [behaviouralinsights@dh.gsi.gov.uk](mailto:behaviouralinsights@dh.gsi.gov.uk)

This document can also be viewed on our website at: [www.cabinetoffice.gov.uk](http://www.cabinetoffice.gov.uk)

Ref: 403936/1210