



# Climate & Rapid Behaviour Change

**What do we know so far?**

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## Introduction

First, we can't imagine a situation being different. Then things change and we can't imagine going back to how they were before.

The summer of 2018 will be remembered for record-breaking extreme weather events ranging from temperature highs, to fires and floods from Japan to the United States and Bangladesh. This year is also when the world will take stock of progress towards internationally agreed action to control climate change. Climate scientists have taken a long, hard look at the likelihood of success and the action needed to deliver it.

When targets were set by the global community in Paris, in December 2015, to minimise climatic upheaval due to warming of the atmosphere, the agreement was to halt temperature rises "well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels."

The inclusion of the 1.5°C figure was argued for by the 'climate vulnerable' group of countries, and represented an important recognition of the severe consequences of warming not far in

advance of what has already happened since the advent of the industrial era. Vitality, the carbon maths of holding temperatures half a degree lower than the more commonly discussed 2°C implies a very different, more rapid and transformative agenda for action.

Several implications of this shift include:

- ▶ That current national pledges on reducing greenhouse gases and on plans for adapting to climate upheaval are not enough to meet crucial agreed targets and protect populations.
- ▶ While switches to clean energy systems are accelerating and impressive, the necessary global rate and scale of change in terms of energy, land, urban, infrastructure and industrial systems is larger and has no exact historic precedent.
- ▶ There could be a 'win-win' in changing our food system to be more climate friendly, with diets becoming healthier and land use changing to be more climate proof and climate friendly.

- ▶ A very large redirection of finance and investment will be needed to switch out of old, polluting infrastructure and introduce 'low emission' buildings, transport systems and more.
- ▶ Critically, there is great potential to achieve positive change in two areas that, so far, have been largely marginalised: reducing the demand for things that are making climatic upheaval worse, and changing some of our more damaging behaviour.

This report focuses on this last point which, we believe, has been insufficiently explored in relation to global warming. We say that because, in recent decades and in many other areas of public health, huge effort and resources have gone into changing ways of behaving that we have learned are very damaging to ourselves and people around us, such as smoking. After a summer of lethal extreme weather events, it is becoming clear too that disruption of the climate is a major public health issue.

Equally clear from a scientific point of view, is that without significant and rapid behaviour change, specifically among the world's highest polluters, the task of staying below 1.5°C will not be possible. The good news is that more is known about successfully changing previously widespread and damaging behaviour change than typically gets acknowledged within the climate debate.

Lastly, when the need for 'rapid transition' is mentioned, it is an acknowledgement that the climate is changing faster than we are. And that we need to make rapid

shifts in how we live, work and run the economy, so we can all thrive, fairly, within planetary ecological boundaries. We mean rapid transition that demonstrate examples of change whose speed and potential scale respects key thresholds – such as the globally agreed 1.5°C degree upper limit on global warming – and which advance social justice. In practice, these are clear, quantifiable changes in our values, behaviour, attitudes, and use of resources, energy, technology, finance and infrastructure that will take place over the next five to ten years.

## What do we know so far?

Things change. It's one thing that is reliable. But the climate is changing faster than the attitudes and behaviour of the people most responsible for causing its disruption. Now, in the face of potentially runaway climatic upheaval and corrosive inequality, the world needs change faster than anything governments are planning for.

All societies have old cultural roots. Folk wisdom says that you can't teach old dogs new tricks. But is that true? There are plenty of examples where societies have identified well-worn patterns of behaviour that they realise are self-harming and destructive, and have sought to change them.

Those in positions to influence events are challenged to learn from where, when and how things have changed very quickly. Then a greater shared understanding of what works can be nurtured to create action at the scale and

speed needed. Enough evidence-based hope has the potential to remove excuses for inaction and illuminate ways ahead for progressive, rapid transition.

History shows that many elements can enable and sustain successful transition – from regulation, to technology, finance and new infrastructure, popular social mobilisation, shifts in social norms and behaviour change.<sup>1</sup> All will be required to maintain a habitable climate and meet the goals of the Paris Climate Accord. None will work in isolation and they are interconnected. Finance, for example, can move out of fossil fuels and private transport into renewables and mass transit systems. A shifting sense of what we regard as normal results in new regulations, and these then normalise and generalise behavioural change.

This report looks at one part of the puzzle that tends to get lost in discussions about the possibility of rapid transition, often because it is assumed to be too hard to change. Yet stopping dangerous climate

change and the passing of planetary boundaries means humankind as a whole, but specifically wealthier populations, consuming differently and less. Both involve changing how high-emitting social groups live and consume. Attempts to change behaviour that is damaging can face opposition from those who argue that people should be free to choose what harm they do to themselves. Yet it is a different matter when such behaviour also harms others and passes on significant costs to the rest of society. Such debates have been woven extensively around smoking and drinking, as – even where the behaviour can be successfully isolated to prevent direct harm to others – typically, the rest of society is left, for example, to pick up large health costs.<sup>2</sup> What do we know has worked in bringing about behaviour change in cases like these? We know a lot, and most importantly we know that even where difficult and highly addictive behaviours are concerned, and some promoted by powerful corporate interests, change in short periods of time is possible.

## Changing behaviours known to have damaging consequences: what has worked?

### Smoking – another damaging emission

Smoking was, for a long time, promoted by an industry that knew about, but publicly denied, knowledge of the harm its product caused. Comparisons are

close and disturbing with oil companies like ExxonMobil were aware of climate change as early as 1977.<sup>3</sup> Yet they publicly refused the reality and engaged in misinformation on the issue.<sup>4</sup> A powerful commercial lobby pitted against a scientific community, about the impact

of an everyday product used by a large proportion of the population. Trying to change people's behaviour in the face of corporate interests sowing doubt about the need for action, and the depth and nature of change needed, is something we face today with climate change. But it was achieved with tobacco, a highly addictive product, and relatively quickly. What can be learned from how it was done?

In terms of how you shift engrained behaviours, decades of public health experience provide insights, for example, from another kind of toxic emission. The biggest indicator of stopping smoking, according to public health officials is whether you 'believe' you will stop. Getting to that point requires a comprehensively designed approach – but we do know what works.

In wealthy nations like the UK, smoking is in long term decline, with an official ambition to see 'a tobacco-free generation by 2025'.<sup>5</sup> Today, less than one in five adults still smoke.<sup>6</sup> But in the early 1970s, over half of men and over 40 percent of women smoked.<sup>7</sup> So public health authorities are applying the lessons of what has worked already to see a generational shift in a behaviour that is particularly difficult to change, because it is known to be powerfully addictive.

- ▶ Think a generation ahead, by acting to prevent the uptake of the damaging behaviour – smoking – by young people through education and awareness- raising.
- ▶ making the product related to the damaging behaviour – tobacco – less affordable.

- ▶ preventing the promotion of the product related to the damaging behaviour – tobacco and cigarettes and their association through advertising with healthy things like sport.
- ▶ insisting on negative branding- placing images of cancer victims on cigarette packets. Raising awareness of the harm caused by consumption of the product, to the self and to people near to you who you care about. Research by Canadian authorities found that increasingly graphic depictions of the internal harm caused by smoking on cigarette packets was an effective dissuader.<sup>8</sup>
- ▶ effective regulation of the harm-causing tobacco products.
- ▶ reducing people's exposure to second-hand smoke, such as regulating against smoking in public and shared domains.
- ▶ supportive programmes and services to provide therapeutic group and individual intervention for smokers.

Graphic health warnings work best with 'light' smokers. Hand holding, social belief that 'thousands of others like you stopped' – 'never give up giving up' work best with heavily addicted smokers.

understand and employ the power of social networks – just as a network can spread harmful behaviour, it can also help end them. A person is 34% more likely to quit smoking if a co-worker does so, 36% if it's a friend, and 67% if a spouse.<sup>9</sup> Public health campaigns – such as 'Stoptober' – by creating virtual communities, can be

cost-effective and help create positive social contagion effects. For every £1 invested in measures to control tobacco, an estimated £11.38 is saved over the lifetime of the smoker.

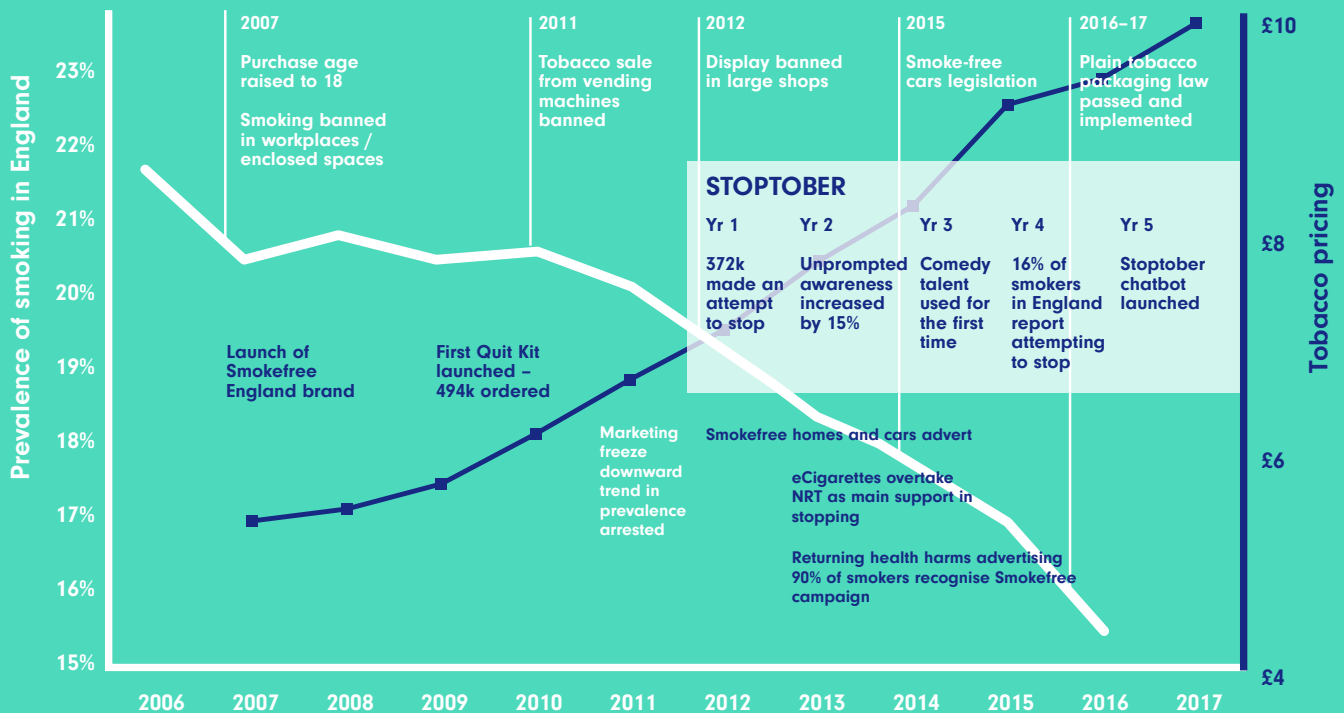
Much research acknowledges the need to recognise the often complex issues and circumstances in people's lives that lead to them engaging in damaging behaviour. This means that many push factors also need to be addressed, such as people facing a lack of opportunities in life, to stress and being socially isolated, which can increase risks.

Perhaps the biggest insight, which contradicts a key, recent fashion in economic policy, is that there is no

effective 'nudge' strategy to achieving the outcome of changed behaviour to reduce smoking. Comprehensive and targeted approaches incorporating official acceptance and commitment to tackling the issue, followed by education, regulation, support and culture shift have been the ingredients of success.



**Figure 1. UK policy interventions to change smoking behaviour**





## Driving

If the figures for death and physical harm relating vehicles were the result of a disease, it would be described as an epidemic and a public health emergency. Things are still bad today but many industrialised countries have improved beyond recognition in recent years. To achieve that change, it involved changing people's perceptions of risk about their own behaviour, raising awareness of the resulting harm to self and others, persuading people to leave their cars at home and take different forms of transport if they planned to drink, and changes to vehicles themselves and the physical driving environment. Climate change requires a more realistic understanding of the risks that result from what we do, and for us to change our transport behaviour, to use cleaner, more efficient and healthier forms of getting around. It means designing out the need to drive as much as possible and producing better vehicles. To tackle climate change, what can we learn from how change has already been achieved?

In common with most wealthy countries, vehicle traffic has increased vastly in the last half a century. Not only has this had a huge environmental impact, contributing to climate change, but the way people drive has led to traffic accidents becoming one of the leading global causes of death and injury. Globally, each year 1.25 million people are killed in road accidents and between 20–50 million more are injured (air pollution related to traffic emissions causes many more premature deaths).<sup>10</sup> Such accidents are the leading cause of death for young people aged 15–29.<sup>11</sup>

Car use in the UK was 20 times higher in 2016 compared to 1949, but the risk of being injured or killed fell almost every year from 1949, when there were 165 deaths for every billion miles driven, and fell consistently and significantly since the turn of the millennium to 2015 when there were only 5.4 such deaths.<sup>12</sup> The dramatic change is attributed by authorities to changes in the structural driving environment and changes in driver behaviour:

- ▶ improvements in education and training;
- ▶ improvements in vehicle technology and highway engineering;
- ▶ improvements to trauma care;
- ▶ the introduction of road safety policies, such as speed limits and speed cameras;
- ▶ enforcement of legislation;
- ▶ and behavioural change.<sup>13</sup>

Changing harmful behaviours related to driving has, like smoking, been a major focus of concern. Public health and safety campaigns have tended to focus on three key bits of behaviour: the wearing of seat belts, drink driving and speeding.<sup>14</sup> In all three areas, again like smoking, the potential harm to the person engaged in the behaviour, and to the people around them, have been the focus of campaigns for change. In most cases, they have concerned attempts to make people behave in accordance with laws already in place, and been done in tandem with measures to improve enforcement and change offenders behaviour, for example by retraining drivers.

### Seat belts

The 1970s saw the iconic public safety campaign 'Clunk-Click Every Trip', which sought to conjure and embed the physical activity of putting a seat belt on. Also, like more recent anti-smoking campaigns, shock tactics conjuring potential harm were used, such as adverts and billboards asking: 'How would you like your face smashed in?'

### Speeding and drink driving

With laws controlling speeding and forbidding drinking and driving already in place, but a high prevalence of dangerous driving linked to speed and alcohol, the challenge was to shift social norms to make the behaviours unacceptable, whilst also focusing on legislative enforcement. Slogans like 'Kill Your Speed. Not a Child' and seasonally targeted campaigns like 'Drinking and Driving Wrecks Christmas' were common in the 1980s and 1990s. 'Dying for a drink' was a more recent approach. A strong focus on raising awareness of unforeseen and unintended consequences of what might have been considered 'normal' behaviour was a common factor.

One point about these deliberate attempts to shift harmful behaviour, is that they have been maintained and consistently applied over decades.

## Safe sex, public health and the HIV/AIDS revolution<sup>15</sup>

Sometimes there are wholly unintended, negative consequences from doing things that are entirely natural. They result from

a lack of awareness of a problem, or the risks of certain behaviour. When the life-threatening problem of HIV/AIDS emerged, it resulted partly from human intimacy, an area of our lives in which it can be very difficult to talk about issues of risk, let alone change behaviour. That change was achieved is a testimony to our capacity to address very difficult problems. From a climate change perspective, there are perhaps lessons to be learned for the comprehensive nature of the approach needed for change to occur.

In 1980, a resident of San Francisco became the first person in the USA subsequently known to have HIV/AIDS and the condition is still a major global public health issue. But it is no longer among the world's top ten causes of death, and from being responsible for 1.5 million deaths globally in 2000, by 2016 that number had fallen to 1 million. According to the World Health Organisation (WHO) from 2000 to 2016, new HIV infections fell by 39%.<sup>16</sup>

Key to reversing the lethal trajectory of HIV/AIDS was identifying vulnerable population groups, developing antiretroviral treatments (ART), demystifying and tackling prejudices surrounding the condition, and developing accessible services for those at risk and those infected. Among those at risk are men who have sex with men, people who inject drugs, sex workers and their clients and prison populations. Obstacles highlighted by the WHO to even more rapid progress are the range of legal and social issues faced by at-risk groups that make access to testing and treatment more difficult.



Between 2000 and 2016, new HIV infections fell by 39%, and HIV-related deaths fell by one third with 13.1 million lives saved due to ART in the same period.<sup>17</sup> This achievement was the result of great efforts by national HIV programmes supported by civil society and a range of development partners.

Even so, an intense period of learning, around the world, has led to the development of effective treatment and prevention regimes and a good understanding of what constitutes best practice. For example, HIV testing should be voluntary and include: informed consent, confidentiality, counselling, correct test results, and connection in terms of being linked to care, treatment and other services. Improved prevention has been based on targeted risk reduction, such as:

- ▶ Promotion of male and female condom use.
- ▶ Provision of easily accessible testing and counselling for HIV and other STIs.
- ▶ Provision of easily accessible testing and counselling linked to tuberculosis care, as the most common illness and cause of death among people with HIV.
- ▶ Voluntary medical male circumcision known to cut by 60% heterosexually acquired HIV infection in men.
- ▶ Provision of antiretroviral drug use for prevention which can reduce transmission to a sexual partner by 96%, and used pre-exposure, can block infection when taken by HIV-negative people.

The key to tackling the spread of HIV/AIDS has been programmes promoting harm reduction for people who inject and use drugs, a particularly vulnerable group whose lives can be chaotic. This has meant overcoming forms of prejudice to provide, for example, sterile injecting equipment, including needles and syringes, to drug users, for each injection to stop the sharing of equipment and drug solutions. Similarly, it has meant treatment of dependence, and providing drug, opioid substitution therapy, along with needle and syringe programmes.

Eliminating mother-to-child transmission of HIV during pregnancy, labour, delivery or breastfeeding has required another targeted and successful intervention. Without programmes rates of HIV transmission from mother-to-child can be between 15-45%. But the provision of anti-retroviral (ARV) drugs as soon as possible during pregnancy and breastfeeding can prevent the transmission of infection.

In 2016, over three quarters (76%) of the estimated 1.4 million pregnant women living with HIV globally received ARV treatments to prevent transmission to their children. Real ambition has characterised the global response too, with the WHO recommending anti-retroviral therapy (ART) to treat all people living with HIV, raising the number of people eligible for ART from 28 million to all 36.7 million people living with HIV. By mid-2017, 20.9 million people living with HIV were receiving ART globally. The target is now to end the AIDS epidemic by 2030.<sup>18</sup>

## Antibiotic resistance

Although a relatively recent discovery in human health, antibiotics quickly became taken for granted. So much so that many people simply assume a wide range of illness that once were lethal can now be easily cured with a course of antibiotics. Their subsequent overuse has left the medical community deeply concerned that we stand to lose the benefits of one of the great medical discoveries of the 20th century. Similar to climate change, one of the biggest problems concerned health officials have found is that 'people don't care' about the issue. There was a widely held assumption that 'if it's that important, the government would act.' The challenge has been to take an issue which, if perceived as a threat at all, was seen as a 'future threat', to making people understand that it had immediate impacts on people, and especially children, now. Their message was 'keep antibiotics working.' Lessons are emerging about changing behaviour on this issue that might now inform change in the light of the climate challenge.

The discovery of antibiotics ushered in a golden period of disease prevention and cure. Because of them, a handful of generations have been able to live secure in the knowledge that they could be cured or live free from a host of conditions that would have been likely death sentences to their very near ancestors.

But overuse and misuse of antibiotics has radically reduced their effectiveness and led to the rise of antibiotic resistant strains of infections. To prevent the catastrophic further loss of antibiotics, there are

programmes to change behaviour amongst both patients and those prescribing medicine.

A campaign titled 'Keep Antibiotics Working' by Public Health England was introduced to help meet the government's target to halve the inappropriate prescription of antibiotics by 2020. One way to do that was to change people's behaviour as patients to reduce public pressure on GPs to prescribe.

A six-week regional pilot programme in the north-west of England led to surprisingly rapid, significant change. It connected with 1.2 million people using social media and was supported by 6,400 local partners which included GPs, pharmacies, local authorities and children's centres. After just six weeks, the campaign had a demonstrable effect, with fewer people reporting that they would ask their GPs for antibiotic prescriptions, and GPs reporting nearly one-in-ten (9%) fewer requests.<sup>19</sup>

## Changing diet

The global food system plays a huge role in the issue of global warming. Agriculture is a major user of energy and fossil fuels and a source of greenhouse gas emissions in other ways, such as through livestock. How we farm also has a profound, relative effect on how carbon is absorbed into the soil or released into the atmosphere. What we eat has a huge impact too. Some diets – such as those more based on plants than animals – are much more climate friendly. Again, a great deal of insight into how positive behaviour changes our relationship towards food has

developed over time. Patterns of eating can change relatively quickly. In addition to the rise in meat eating internationally, there is also evidence of counter-trends in some societies, such as an increased uptake of vegan diets. What can public health research on diets contribute to the climate debate?

Changing what, and how much, we eat is a pervasive concern in wealthy countries. In a global perspective, it can seem incongruous that there are fairly equal numbers of clinically overweight and malnourished people in the world. But even in richer nations, obesity is not simply the result of overeating but poor diet often associated with actual and relative poverty. The scale of the problem, and the size of the profitable industry that has grown up around dieting, means that how to change eating habits and switch to 'healthy living' is also well-researched.

Structural, environmental and economic considerations create the context in which different eating behaviour is more or less likely. High calorie, poor nutritional quality food, actively promoted by food retailers creates an environment in which poor diet is more probable. Marketing experts speak of helping companies make their products more 'mentally and physically' available. A combination of advertising and the point of sale promotion of chocolate and other high sugar content foodstuffs do just that. Regulating the price and promotion of foods and drinks known to be unhealthy in this way is one important way of altering the environment and helping to change behaviour. Another key factor is the design of the built environment and whether or not it encourages or deters physical activity. A

transport system that encourages driving and discourages walking, for example, will lock-in less healthy lifestyles and, through vehicle emissions, create more health problems.

When it comes to individual and group behaviour, that happen within a given food and economic environment, a range of interventions are well understood to be effective changing the way people behave.<sup>20</sup>

Approaches such as self-monitoring and self-regulation, using techniques like goal-setting, prompting, self-monitoring, feedback on performance and reviewing goals are seen consistently to be effective tools to change behaviour. Teaching a different behaviour, recording it, such as by writing a food diary, and having strategies to cope with relapses, can all successfully change behaviour.

To encourage physical activity, effective techniques include behaviour prompting, such as telephone reminders, like with diet, self-monitoring by writing an activity diary, personalised messages relevant to a person's situation and progress, and goal-setting, like taking so-many steps per day.

Targeting both diet and activity levels at the same time tends to lead to more effective weight management, as does having a supportive social circle. Regardless, long-term behaviour change is challenging.

## Extreme hazard awareness: reducing disaster risk through rapid behaviour change

In a bad year, sudden onset natural hazards – most notably floods, windstorms, earthquakes and volcanic eruptions – take close to one third of a million lives. Despite this, awareness and understanding of natural threats within at-risk communities, in particular in less industrialised nations, is poor at best. Consequently, reducing disaster risk, when the realisation of a natural threat is imminent, becomes critically dependent upon the urgent and rapid change in people's perception and action, from lack of awareness of risk and inertia to understanding and effective response. Nowhere is this demonstrated better than in communities located on the flanks of volcanoes.

At least 1,500 volcanoes on the planet are in eruption or have the potential to erupt. In less industrialised nations, where volcanoes are often poorly monitored, if at all, and eruption records sketchy, local populations can be in complete ignorance of any threat. If there has been no eruption for centuries, they may not even know that their local mountain is a volcano. In such situations, where awareness of risk is low to non-existent, any period of volcanic unrest that might presage an eruption requires a rapid transition in the appreciation and understanding of the local population in relation to the growing threat. Failure to do this can quite easily result in a major catastrophe and the loss of many lives.

Two examples from the last fifty years illustrate how this can work and what happens when it doesn't.

### [Rabaul, Papua New Guinea, 1994](#)

The city of Rabaul, on the island of New Britain, sits on the edge of a giant volcanic crater or caldera. In the mid-1980s – following more than half a century of quiescence – a dramatic increase in seismic activity and a swelling of the ground surface warned of fresh magma rising towards the surface. Staff at the Rabaul Volcano Observatory (RVO), and emergency managers, launched a crash programme designed to educate the population in the dangers presented by a new eruption and in how to respond. This included training exercises and evacuation drills. Eventually, the unrest subsided without an eruption and life returned to normal. Then, on 17 September 1994, violent earthquake activity began, accompanied by major swelling of the ground surface. As the situation worsened, the RVO progressively raised alert levels. By the time, however, that an evacuation was called, most of the population had already left. The eruption began after just 27 hours of activity, but only two lives were lost; one to lightning, another to road traffic. The education programme undertaken a decade earlier had successfully changed the behaviour of the population and, in the process, saved many hundreds – perhaps thousands – of lives.

### [Nevado del Ruiz, Colombia, 1985](#)

In November 1984, the ice-covered volcano, Nevado del Ruiz, in Colombia, began to show signs of unrest. Small-scale activity began soon after and continued for the next 12 months. Concerns were

raised early on that a larger eruption could melt part of the ice cover, leading to the formation of mudflows capable of reaching the nearest towns. These concerns increased in November 1985, when activity ramped up, and half-hearted attempts were made to alert the local population to the threat. A combination of inertia, local and national politics, poor communication and confused messages meant, however, that most people took little notice. On November

13, when torrents of hot mud poured down the valleys draining the volcano, most people were still in their homes or at work. Three quarters of the population of the town of Armero – more than 23,000 people – lost their lives, along with many hundreds in neighbouring communities. The disaster, which could have been completely avoided by a concerted effort to inform and change the behaviour of the local population, was the second largest volcanic catastrophe of the 20th century.

## THEORIES OF BEHAVIOUR CHANGE THEORY – A SUMMARY

In the last few decades, changing what people do in relation to behaviour that causes harm, such as smoking, drinking and other addictions, drink-driving, not wearing seat belts, and high risk-taking sexual activity, has been extensively researched. The challenge of improving public health and, in doing so, reducing the burden on the health service, has meant a better understanding of what leads to behaviour change.

Research related to the HIV/AIDS crisis, drew on work looking at such change and summarised four models: the Health Belief Model, the Risk Reduction Model, the Stages of Change, and the Theory of Reasoned Action.<sup>21</sup> The first – the Health Belief Model – emphasises the degree to which an issue is perceived in terms of being a serious threat, and the benefits and barriers to action, coupled with the belief of the individual in their ability to act. The weakness of this model is said to be its lack of recognition of the influence of social norms, together with broader environmental and economic influences.

The Risk Reduction Model identifies change as a three-stage process: first recognising and labelling personal behaviour as damaging, then making a commitment to change behaviour before taking action through seeking information, identifying alternatives and following through with actions. A limitation of this approach is its individualism which takes insufficient account of social and cultural issues that might constrain the ability to change.

The Stages of Change model explicitly recognises that behaviour change is a process and the need to address the particular stage that a person (or potentially a society) is at. The five stages are: pre-contemplation, contemplation, preparation for action, and maintenance – initially seen as a linear process, they are now approached as cyclical

in nature. This theory to understand and catalyse behaviour change also insufficiently takes account of the structural reasons why people behave in a certain way, offering a 'descriptive' rather than 'causative' explanation of behaviour.

The Theory of Reasoned Action, more commonly applied in practice as the Theory of Planned Behaviour, assumes a rational basis for behaviour which is under an individual's control – and connects individual beliefs, attitudes and intentions to behave in a certain way. This approach does include the influence of social norms, but again, due to having an individualistic approach, it underplays structural and environmental factors.<sup>22</sup> Also, it can underestimate the degree to which a mandated change in behaviour, such as the introduction of seat belts, can change a belief, rather than a change in belief being a necessary precondition for behaviour change.

The argument that a structural change in a person's environment that promotes a particular behaviour – such as the introduction of local authority recycling – can lead to a change in attitude has long been argued.<sup>23</sup> Hence increased recycling may be interpreted by the person doing it as a cue that they must care about recycling and hence their attitude towards it changes.

But, many policy approaches have been built around so-called 'ABC' models of behaviour change, in which attitudes (A), drive behaviour (B), and hence choices (C).

But where climate change is concerned, the point is made that, typically, 'individuals do not consciously decide to emit carbon. Rather, emissions are associated with the practices and routines of everyday life, from cooking to travelling.'<sup>24</sup>

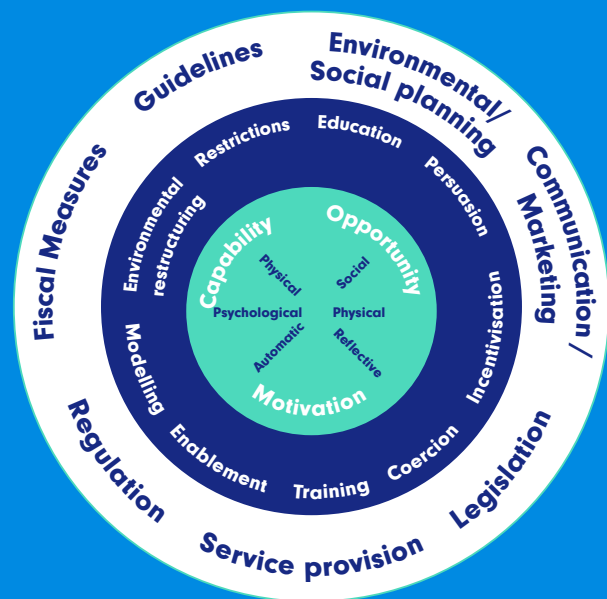
In this case, should you live somewhere with poor public transport, or where available energy sources are predominantly fossil fuels or biomass, people will not simply be able to choose alternatives. Similarly, the routines of daily life are often embedded in the use of technologies, materials and systems which individuals have little power to alter. As such:

*'Interpretations of comfort and of the 'need' to heat and cool buildings to a steady 22 degrees C whatever the weather outside are not facts of nature, nor are they simply expressions of individual preference and choice. These issues require opening up discussions regarding the definition of taken for granted needs and the different means by which warmth and welfare, freedom and mobility, and economic and energy security might be achieved in different settings.'*<sup>25</sup>

The models mentioned above are just four well known ones – but "over 60 socio-psychological models and theories of behaviour have been identified, many of which have been used as the basis for designing and implementing health promotion programmes, with varying success."<sup>26</sup>



- Sources of behaviour
- Intervention functions
- Policy categories



(Source: Michie *et al*, 2011)

Self-determination theory, for example, proposes that – for lasting behaviour change to be achieved – it is necessary to combine developing a person’s skills with employing their intrinsic motivations and reason. In other words, it is a process of change that does not rely on pressure being exerted from the outside, whether in terms of rewards or penalties. Being self-motivated is viewed as more stable and enduring. In this context it is important for a person to see the behaviour as attractive and in line with their values, goals and ‘sense of self’.

There are also dangers associated with relying on monetary incentives for behaviour change as this can lower a person’s intrinsic motivation: if the reward is reduced or removed, the desired behaviour too can change or stop.<sup>27</sup>

Everybody carries around with them so-called behavioural and normative beliefs which are profoundly influential in what we do. They are referred to as cognitive structures and shape powerfully what we see and accept as ‘normal’ behaviour, and against which we ‘test’ or judge the actions of others and ourselves. These structures influence attitudes and set our subjective norms. In turn, the attitudes and norms help form our intentions to behave in a certain way.

More recently the multiple insights of these many models which have stood up empirically and against the test to time, have been synthesised into a ‘behaviour change wheel’ (see fig), that understands behaviour change in terms of a combination of capability, opportunity and motivation, and the circumstances which shape those three factors. From this, we derive a range of interventions most likely to prove effective in changing behaviours.<sup>28</sup> (see table)

Interventions	Definition	Examples
<b>Education</b>	Increasing knowledge or understanding	Providing information to promote healthy eating
<b>Persuasion</b>	Using communication to induce positive or negative feelings or stimulate action	Using imagery to motivate increases in physical activity
<b>Incentivisation</b>	Creating expectation of reward	Using prize draws to induce attempts to stop smoking
<b>Coercion</b>	Creating expectation of punishment or cost	Raising the financial cost to reduce excessive alcohol consumption
<b>Training</b>	Imparting skills	Advanced driver training to increase safe driving
<b>Restriction</b>	Using rules to reduce the opportunity to engage in the target behaviour (or to increase the target behaviour by reducing the opportunity to engage in competing behaviours)	Prohibiting sales of solvents to people under 18 to reduce use for intoxication
<b>Environmental restructuring</b>	Changing the physical or social context	Providing on-screen prompts for GPs to ask about smoking behaviour
<b>Modelling</b>	Providing an example for people to aspire to or imitate	Using TV drama scenes involving safe-sex practices to increase condom use
<b>Enablement</b>	Increasing means/reducing barriers to increase capability or opportunity <sup>1</sup>	Behavioural support for smoking cessation, medication for cognitive deficits, surgery to reduce obesity, prostheses to promote physical activity
<b>Policies</b>		
<b>Communication/marketing</b>	Using print, electronic, telephonic or broadcast media	Conducting mass media campaigns
<b>Guidelines</b>	Creating documents that recommend or mandate practice. This includes all changes to service provision	Producing and disseminating treatment protocols
<b>Fiscal</b>	Using the tax system to reduce or increase the financial cost	Increasing duty or increasing anti-smuggling activities
<b>Regulation</b>	Establishing rules or principles of behaviour or practice	Establishing voluntary agreements on advertising <sup>1</sup> [nb: this constitutes 'self-regulation', distinct from actual legislation, see next row]
<b>Legislation</b>	Making or changing laws	Prohibiting sale or use
<b>Environmental/social planning</b>	Designing and/or controlling the physical or social environment	Using town planning
<b>Service provision</b>	Delivering a service	Establishing support services in workplaces, communities etc.

(Source: Michie *et al*, 2011, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3096582/>)

# What is working now?

All the well-researched examples discussed above, of concerted strategies aimed at achieving behaviour change, can be credited with both saving and transforming lives. Many have taken effect at the level of society in the course of a few decades and sometimes shorter time.

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The scale and speed of change required by the science of climate change is, however, of a different, faster order. We can take encouragement from the realistic possibility of behaviour change based on these case studies, where comprehensive, properly resourced and integrated approaches are taken. But is there anything else that suggests rapid and adequate change can happen?

In the last few years, and in many cases happening too recently for academic research to have 'caught-up' with the shifts, several issues have experienced extremely rapid changes in how they are perceived, in behaviour and in a shift of the 'social norm' surrounding them. It begs the question, is something happening at a larger level that is enabling the process of changing values, norms and behaviours to speed up? Rapid evolutions across communication technologies and social media allow communities of interest to form and express themselves. The speed of information diffusion allows an amplification of 'social contagion' effects. And, a crisis of confidence in mainstream economic models that has persisted since the financial crises of 2007–08 leaves something of an ideological vacuum that new ideas and forms of organisation struggle to fill.

Each, on their own, will have a unique fingerprint of change. And, each may be more or less profound in terms of the change they represent. But taken together, here are a range of recent examples that pose the question of whether the possibility of rapid transition is greater than typically believed in.

## Single use plastics

Like other seemingly indispensable aspects of modern life, such as aviation, the ubiquity of plastics is a very recent phenomenon, itself an example of rapid adoption. The post-war consumer boom of the 1960s in many Northern hemisphere countries brought with it a culture of disposability, short-term convenience and built-in obsolescence. It also coincided with a glut in global oil production and rapid developments in the material science of plastics, an offshoot of the fossil fuel industry. Just a few decades on, the prevalence of plastics, and especially single use plastics, has had huge environmental consequences. Plastics are found in the most remote, inaccessible parts of planet, and incorporated into the bodies of animals throughout the food chain, including people.

In the USA alone, an estimated 500 million plastic straws are thrown away every day. When plastics make their way into the environment they enter the food chain by being eaten by animals. Broken down, and in the form of micro-plastics they are ecologically toxic and lethal to wildlife. One estimate suggests that, by 2050, there will be more plastic in the oceans than fish.

While waste has been an issue of concern for many years, the particular threat of plastics, especially to the marine environment became a major issue after footage screened in a BBC television documentary about the health of the world's oceans. The Blue Planet II programme showed albatrosses feeding ocean blown plastics to their chicks. Other footage by divers of extremely remote oceans saturated with plastic pollution proved shocking to the watching public.

Now there is a backlash and rapid moves to reduce plastics. Single-use plastics in particular have, in a very short period, become suddenly unacceptable. Large retailers such as ASDA and Tesco are moving toward banning plastic bags and fast food outlets like Starbucks and McDonalds are removing plastic straws.

In 2011, Ethiopia banned single use plastic bags. In 2016, Karnataka in India introduced a state-wide ban on plastics. Bags, plates, cups, plastic cutlery and even cling film were banned from use and sale by wholesalers and retailers. Bangladesh has a ban on plastic bags and India's major city, Mumbai, strictly enforces a plastics ban. The ban was

backed up by seizures of illegal plastics. San Francisco in the US banned plastic shopping bags in 2007, plastic water bottles in municipal sites in 2014, and styrofoam in 2016. Beyond major urban centres, the regional coastal town of Penzance announced itself in 2018 as the first UK town to go plastic free.<sup>29</sup> Major retailers everywhere are now under extreme pressure to remove single use plastic packaging.

## Smoking on trains, in pubs and clubs

Unquestioned for many years, when the practice of smoking on public transport, in pubs and public buildings, was banned, it happened overnight. Now many find it hard to even imagine a time when it was acceptable. While the advocates for such public health measures were reviled and resisted by the tobacco lobby for years, when the change came, behaviour altered almost instantly, even in places where smoking appeared to be part of the fabric of a local culture, like in the café scene in fashionable Paris where a Gauloise was an everyday accessory to intellectual life, behaviour changed at the stroke of legislation being passed.

## 'Manels'

In a bid to challenge sexism in working life, and in particular sectors like business and academia where conference-going is common, a blog called 'all male panels' invited people to submit pictures or notices of conference line-ups that were all male. It was done with humour – under an ironic title reading 'Congrats, you have

an all-male panel!’ each post includes a small picture of the macho Baywatch actor David Hasselhof giving the thumbs up – and the intention to embarrass conference organisers to change.

Awareness of the initiative spread virally and quickly. By calling out a problem simply and making it visible, in such a way that people started to notice and look for examples, very rapidly it became unacceptable to organise events with male-only panels. In the academic world, the public and voluntary sector, it is now almost unthinkable.

## Men-only clubs and functions

Men-only clubs, once common, and now almost extinct. But male-dominated social environments still persist. One such example is elite, high net worth individual charity fundraising by organisations like the Presidents Club. But a single expose by a journalist at the UK’s *Financial Times*, which exposed the toxic masculinity and brazen sexism of their events, brought an end to the event and the organisation. Daylight had brought about a sudden change with implications for all such similar events. They had overnight become unacceptable.

## #MeToo

The #MeToo movement, launched in the wake of revelations about systemic sexual abuse in the film industry, and in the context of the election of a US President who had openly boasted about his own

abusive behaviour towards women, had a rapid domino effect leading numerous other allegations of abuse surfacing. In reaction, many large companies and institutions were compelled to address their policies and procedures both to do with gender equality, and for reporting and tackling abuse. Long-established and systemic patterns of behaviour were suddenly called into question with behaviour change an acknowledged priority.

## LGBTQ

Awareness of the discrimination and abuse faced by transgender people has also undergone a rapid change and, with it, there has been a rise in the recognition by the media and institutions of the need for active policies to prevent misrepresentation and prejudice, whether explicit or implicit. As with several of the issues mentioned here, it is not they are new, or that there have not been long-standing campaigns to change attitudes and the prejudiced behaviour of organisations and individuals, but a moment arose in which a rapid shift occurred.

One indication of the shift is the reporting of abuse, with one in three people identifying as transgender reporting abuse in a 12 month period in 2017. Another sign of greater awareness and recognition is the number of people referred the specialist Gender Identity Development Service (GIDS) run by the NHS. It helps young people experiencing difficulties with their gender identity and, in 2009, received 97 referrals. By 2017, that number had risen to around 2,600.

Over a three year period, referrals rose by 103%, 42% and 29%.

## The vegans have landed

Concern about health and the environment has seen a significant and rapid rise in the number of people in the UK switching to plant-based diets, with an upward spike in particular for people identifying as vegan. Veganuary was launched in 2014, with 3,300 people signing up; by 2016, there were 23,000 participants, then 59,500 in 2017, and a staggering 168,000 in 2018 – and these are just the numbers that signed up officially online.

In 2016 the Vegan Society estimated that there were just over half a million vegans over the age of 15 in Britain. Research published in Spring 2018 saw that number leap to 3.5 million. Long derided as an almost comic minority, there was a sense in which, in the UK, the vegans had landed in the mainstream.<sup>30</sup>

## Disposable coffee cups

At the same time as a sudden change of attitude is making plastic straws unacceptable, disposable coffee cups too are attracting negative attention, with many more people carrying reusable cups and some coffee chains planning to change or actively encouraging the shift with financial incentives to customers. An estimated 2.5 billion such cups are thrown away in the UK each year. Pioneering a change, coffee shop chain, the Boston Tea

Party, with 22 outlets across South West England, introduced a ban on single use cups on 1 June 2018. In the first month, it estimated saving 17,500 waste cups from being thrown away. It expected, and experienced, an initial drop in sales, but implemented the policy as being ‘the right thing to do.’

## Questions and lessons: where next?

First, and most importantly, the lesson of recent history is that rapid change in damaging behaviour is possible. Very quick shifts in social norms seem to be increasingly in evidence. Even where they may have been decades in the making, attitudinal changes driving different behaviour appear to be catching people by surprise with their swift acceptance in the cultural mainstream. While that may seem paradoxical, there is never a guarantee that issues which have been of great concern and the subject of activism for long periods will triumph by winning the argument for change. Yet concerns as diverse as transgender discrimination and plastics waste seem to have done just that.

The relevance of this is that measures focused on behaviour change have been very much marginalised in the mix of policies considered for tackling climate change, due typically to political nervousness. But now, as well as classic economic tools such as pricing and investment incentives for lower carbon energy, climate researchers like those at the Mercator Research Institute on Global Commons and Climate Change, led by the Potsdam Institute for Climate Impact



Research, are concluding that behaviour or 'lifestyle' changes represent one the next most efficient pathways to lower carbon emissions.<sup>31</sup>

This matters, because relying on price alone is limited where high-emission behaviour is not greatly responsive to price – such as with business flying – and also because relying too heavily on price to change behaviour can, in many circumstances be highly regressive, disproportionately disadvantaging low income households.

It matters too because one of the clearest insights from the recent histories of behaviour change is that 'nudge' approaches are revealed to be highly inadequate.<sup>32</sup> Comprehensive approaches are needed involving a mixture of regulation, awareness raising, education, incentives and a mix of support from friends, family, peers and other services.

It is also the case that fairly simple insights from behavioural psychology can have large effects. For example, research by Arizona State University revealed the power of how social norms can drive behaviour change, revealing that hotel towel reuse increased by 36% when, instead of prompting customers with a card on the environmental benefits of reuse, a card was used stating that "most people" reuse.

Language also proved key in research that showed how, merely by changing a few words of description on a menu, significantly more people chose more environmentally friendly, and lower carbon, plant-based menu options.

In this case, again, instead of words emphasising the ethical credentials of the dish, or calling them vegan, healthy or vegetarian, people were persuaded by language focused on flavour or the cultural associations of the food.

Such observations seem to illustrate the way in which people may not behave in a logical, linear fashion, but that patterns are discernible which can also be quite predictable. Insights from the field, already applied heavily by commercial organisations, are being introduced by campaigners for economic rights and social justice.<sup>33</sup> Whole organisations have been set up dedicated to broadening the uptake of insights on behaviour change.<sup>34</sup>

Lessons from the examples of behaviour change given here include that:

- ▶ Rapid behaviour changes are possible, with consistent investment, clear understanding of risks, a reasonable consensus of what needs to happen and the right conditions.
- ▶ Rapid moments of change tend to have considerable momentum built behind them.
- ▶ The science of knowing what to do to produce a specific outcome is often multi-faceted and interdisciplinary.
- ▶ Even effective interventions to achieve behaviour change, executed across the board, won't produce the scale and speed of outcome needed to hit climate targets if not complemented by the right policies and the kind of systems that allow people to learn and adapt over time.

- ▶ Behavioural interventions alone will not deliver fair and rapid transitions. Structural change is needed too. That is not to say that everything has to change at once or in a linear fashion beyond the realms of possibility. Different people and social groups have to try different things at different times, according to their position and power to generate change.

The paradox of the contemporary human condition is that, even as we cling to the familiar and find comfort in habit and

tradition, we constantly transform our cultures and surroundings. As a species we can both fear change and yet be remarkably gifted at making it happen. Metamorphosis is, after all, a natural phenomenon. Human activity is triggering a rapid and life threatening change to our climate. The challenge now is whether those best positioned to alter that course can make changes as quickly. History and recent experience suggests they can. Circumstances may even now be making rapid change more possible.

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