

# 1 Behavioural Incentives and Health

## The 'Science' of Health Incentive Design?

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The logic and limitations of ideal competitive behavior under uncertainty force us to recognize the incomplete description of reality supplied by the impersonal price system.

Kenneth J. Arrow (1963)

Half a century after Kenneth Arrow wrote a seminal paper on medical care that came to be seen as the foundation stone of health economics, the 'behavioural revolution' in public policy has popularised the view that the price system really is an 'incomplete description of reality'.

Although Arrow (1963) necessarily limited his analysis to the role of incentives within 'medical care', today health economics, and more generally its policy discussion, has expanded the scope to the wider challenges of 'health', and even well-being. The importance of behavioural incentives for us lies in the fact that most *health policy problems boil down to solving a behavioural question* (or at times, a 'problem'). Each question triggers a range of potential interventions. For example, in tackling tobacco-related harm, the policymaker could use a hard regulatory action such as a smoking ban, intervene in the price mechanism with a tobacco tax and/or modify the choice environment with controls on advertising, product accessibility or warning labels. Finding the best intervention (or a combination of interventions) is a behavioural question. Such decisions are fundamental to making real and lasting change, for organisations or for individuals. It is certainly not a trivial endeavour. It needs consideration of people's beliefs, social commitments and contexts that rarely feature in standard analyses but which make all the difference to the effectiveness of policy interventions.

With the incorporation of behavioural insights, behavioral health economics can now justifiably be redefined as the science of '*incentives in health and health care*'. It can offer new tools for analysis and intervention design that complement past knowledge in health economics. This is as true for questions of health improvement as it is for questions of system efficiency and efficacy. Behavioural economics, far from replacing what we have come to know in health economics as a discipline, complements its foundations by relaxing some of its rigid assumptions. This implies the adoption of a more realistic depiction of motivation. It does, of course, make its mathematical formulation more complex, and sometimes really challenging as the diversity of social norms and behavioural constraints make a 'one size fits all' equilibrium impossible.

Given its roots in economics, behavioural health economics also draws on methodological individualism (our focus of attention is the individual) and subjectivism

(preference motivators are unique to each individual), but acknowledges that most human behaviour is habitual and driven by non-conscious processes and social cues (e.g., an increase in a meal serving size increases what people eat). Hence, social context matters as it influences both the incentives and the constraints individuals face. By incorporating what are otherwise anomalies of rational decision-making, health economics is enhanced through the extended toolkit of ‘behavioural economics’.

The object of our study is *the human individual*; taken with all its imperfections and adopting all conceivable roles someone can take in society; each of us deciding what to have for breakfast (or whether to have breakfast at all), a physician choosing the best course of action for their patient and along with their patient, a patient deciding whether to turn up at a screening check-up, a health administrator choosing where to build a new hospital or a health minister deciding whether to invest in prevention or cure. The individual of interest to us is not the amazingly capable, rational and optimising ‘homo economicus’ of standard economics. Our agent is readily led by the social norms of their place, is strongly attached to their suboptimal status quo (perhaps locked into a Friday after-work drinking session) and a variety of other biases that lead to decisions they probably later regret.

Real people (sometimes defined as ‘homo sociologicus’) care about others, and not just about themselves. They have social preferences for the well-being of others (or at least some others). They also care what others think of them. They suffer from problems of self-control and impulsivity, they are emotional and fall prey to a form of cognitive short-sightedness that we refer to as ‘present bias’ (or a tendency to care unduly for rewards in the present). These problems are arguably most prominent in the emotive domain of health. In the health domain, it is not just monetary costs (such as the price health and unhealthy alternatives) and benefits that incentivise behaviour. The price of health care is often a second order dimension in peoples choices. This is despite the dominant role of insurance as a funding model and the direct, and other costs to the individual from ill health. Indeed, tangible monetary incentives are often not the most salient influence on actual behaviour even when they are very high. In contrast, making the health system more navigable, perhaps through a simple access pathway or through the availability of timely and understandable information, can make the difference. In Chapter 2, we will discuss how information provision alone is not sufficient, but also how and when information is presented (or ‘framed’).

Another defining aspect of behavioural health economics is its interdisciplinarity. Today, the study of incentives *is an interdisciplinary field populated by insights from many social sciences and disciplines*. But what makes it a specific area of scientific enquiry is the common goal of studying observed behavioural regularities. These allow us to make sense of people’s behaviours, even though they do not fit simplistic rational choice approaches to rationality.

## 1.1 Expanding Simple Rationality Assumptions

Health policy economists using behavioural economics are striving to identify what we can call the ‘systematic irrationalities’ (deviations from the purposeful behaviour of the

ideal ‘homo economicus’) and then describe such actions within wider explanations or models of behaviour, many of which would receive otherwise the label of ‘irrational’.

For the purposes of analytical convenience, standard economics (which we will call ‘introductory economics’ or ‘economics 101’) uses simplified tools or simple models reliant on very idealised (even naïve) assumptions for human decision-making. Such models assume, for example, that individuals are consistent, forward-looking and self-interested, and are able to maximise their utility against a *well-defined* pay-off function. Such a pay-off function summarises their preferences and is commonly known as the ‘utility’ function. From this, a demand function can be derived after accounting for monetary or time constraints. For simplicity, individuals are argued to hold perfect information, and a constrained budget to be allocated to consumption decisions across the full range of potential healthy and unhealthy goods and services available to them. Their decisions depend upon the relative prices of these goods and services, given that the prices accurately reflect the values of these goods and services.

Typically, economic ‘rationality’ is present when the individual’s decisions are assumed to follow (maximise) a well-defined goal function formed by adherence to the axioms of rational choice, which are presented as the solution to an optimisation problem. Important amongst these are the three axioms of ‘consistency’, ‘transitivity’ (if A is preferred to B, and B is preferred to C, then A is preferred to C) and ‘completeness’ (they can assess all possible outcomes). Under such assumptions, preferences can be represented as a function ( $U_i$ ), where subscript i refers to the individual under consideration:

$$U_i = U(X_{mi}, H_i)$$

where  $X_{mi}$  refers to all consumed goods (one’s income under no savings) and  $H_i$  refers to an individual’s health. Health is a good that can be accumulated and invested in as we explain in the following text, which exerts a direct and positive effect on well-being  $dU_i/dH_i > 0$ . The assumption is that individuals face a fixed budget constraint<sup>1</sup> so that they can trade off their health for other goods  $dH_i/dX_{mi} < 0$ . This framework underpins early conceptions of the demand for health, which depicts health decisions as resulting from a trade-off with other goals in someone’s life. One can then produce a series of different models by varying the underlying parameters and constraints individuals face, which individuals are suppose to optimise.

Finally, individuals are assumed to be aware of the health consequences of their behaviours and stick to their carefully reasoned preferences unless new information is provided. Hence, their actions do not suffer from problems of self-control, and their preferences before (ex-ante) and after (ex-post) a behavioural decision always coincide. *Individuals are ‘strong’ and fully responsible for their actions.* Any engagement in unhealthy behaviours, perhaps smoking or excessive eating, is assumed to result from a reasoned willingness to make the trade-off between their health and wellbeing effects of these pleasures. Some economists (notably Becker and Murphy) have developed this approach to produce theories of ‘rational addiction’, which we will discuss later in Chapter 7, which assumes that individuals in deciding to smoke they already account

<sup>1</sup> If P refers to the consumer price index, Q represents the implicit price of health capital and W reflects the overall budget constraint, then  $PX + QH = W$ .

for its long term addicting effects. Nonetheless, all those assumptions are grounded in two classical governing principles in economics textbooks: the principles of *revealed preference* (people's choices reveal their preferences) and of *consumer sovereignty* (the assumption that consumers can discern what is best for themselves). The revealed preference principle argues that an individual's preferences are accurately depicted by their choices. Consumer sovereignty implies that each person is best placed to judge quality and to make decisions for themselves in order to optimise against their own preferences and thus influence the production of goods to meet their preferences.

Against such backdrop, behavioural health economics offers a more complex account based on evidence from observation and experimentation. It suggests that such a simplistic account is problematic when individuals have limited experience (e.g., experience reduces learning biases), have limited self-control or form their preferences by observing others. Even when these do not limit behaviour, individuals seem to exhibit a *preference for diversity that depends on how decisions are framed*. They appreciate different product qualities at different times, and even develop different tastes based on experience ('experience-based choices'). Experiences influence not only our learning but also our emotions in evaluating choices. Emotions matter, both those anticipated (e.g., regret), as well as those directly experienced, which have somatic effects, namely have effects on the body (e.g heart rate) (Lowenstein and Lerner, 2003). Hence, we can observe, for example, that making food choices in advance of dining increases the probability of a healthier choice compared to choosing at the time of eating (Read and van Leeuwen, 1998). That is the context, which we call the "choice architecture", and the social and cognitive constraints individuals face, matters in explaining actual choices.

## 1.2 Preference Exogeneity

Introductory economics models are grounded on exogenous preferences and the so-called *De Gustibus Non est Disputandum* principle ('tastes are not a matter of dispute') (Stigler and Becker, 1977).<sup>2</sup> That is, the individual in the standard model does not change their mind depending on social constraints, and has a strong mind that already foresees their consequences. Experience does not come as a surprise for these individuals, and life does not have tipping points except for insufficient information that tends to be absorbed after it is 'spread into the system'. If introductory economic assumptions are held true, individuals would likely not partake in health-negating behaviours such as smoking, as they would foresee the consequences of such activities in later life. However, although some life experiences follow from people preferences, others (e.g., tipping points such as the expedience of cancer) can manage to change peoples preferences, and become 'value changing experiences' (Akerlof, 1983). Hence, for policy making to manage to change behaviour, it has to relax some of this assumptions, which would have made modelling easier and more beautiful, but entail a departure from explaining reality.

<sup>2</sup> Only in such a framework have economists such as Gary Becker conceptualised smoking resulting from a rational addiction, whereby individuals trade off the future costs of smoking (e.g., a higher chance of lung cancer, etc.) with the 'pleasure' that smoking entails in the present.

### 1.3 Micro-Motives and Health Behaviours

Health behaviours are amongst the most important decisions people make in their lives. The stakes are high. Social scientists working on health policy are confronted with pressing questions on how to organise the health system, how much to spend in order to save or extend life, how to regulate the market and design taxes that impact people’s health through decisions that are influenced by their ‘micro-motives’ (Shelling, 2006). This requires an understanding of the factors that lead people to make choices that improve longevity, curb rising child and adult obesity rates and eating disorders, reduce substance abuse and improve patients’ adherence to treatment regimes or clinicians’ adherence to clinical guidelines. It would be hard to overstate the importance of how to incentivise beneficial behaviour across the spectrum of consumers, care providers, regulators and policymakers. Discerning the underlying behavioural motivations is essential to designing policies to improve the functioning of a health system and tackling persistent challenges to population health and health inequalities.

Reforms that can improve health and the functioning of healthcare systems are mostly rooted in the achievement of behaviour change. The study of incentives could not take higher priority. This chapter is an introduction to this important endeavour.

### 1.4 How Do We Motivate ‘Good Health Behaviours’?

A diverse range of motivations affect health behaviours and are worthy of exploration. The assumptions we make about motivation directly affect the choice of intervention to incentivise beneficial behaviour. Examples of these motivators include, of course, money, but also wants such as status (social hierarchy), self-esteem duty, guilt, shame, self-image, and identity. However, the study of these human motivations, although fertile terrain for economists, is far from our own backyard. Motivational analysis is usually about understanding constraints on behaviour. The introductory economics argument would contend that choices are constrained primarily by budget constraints. Within this singular world view, incentives come from changing the effective relative prices (and costs) of healthy activities compared to others. Accordingly, increasing the price of unhealthy foods or subsidising healthy activities would solve obesity amongst rational beings. In a similar approach to policy, the United States created a system of medical insurance subsidies to make insurance affordable for people beyond the reach of traditional government insurance in Medicare and Medicaid, and employer-purchased insurance. After the implementation of the Affordable Care Act, if individuals were not accessing affordable healthcare insurance, then, the argument goes, this can only be the result of limited information or other constraints beyond prices. The reality, however, was that many of those who have been eligible since 2013/14 still did not make use of the healthcare marketplace subsidies or the government programmes (Gunja and Collins, 2019).

Traditional interventions such as monetary incentives and communication campaigns do have the potential to improve health behaviours but can be costly if they succeed (or if they fail and prove hard to withdraw). Health reducing behaviour persists, even when backed by improved information or even some form of mandate. In some circumstances, monetary incentives have unintended consequences. They may crowd out non-monetary motivations such as social status: Do I still want to be associated with this product if it is 'for the poor'? Do I want to continue donating my time or money to this pro-social activity when the state has now stepped in to do it or pay for it? Motivational crowding of this sort is a serious risk where those already doing the desired action follow altruistic motivations. There is also the risk that communication campaigns might provide excessive information and thus bias individual perceptions or become a waste as they are 'preaching to the converted'. Too much information can lead to information overload and thus decision paralysis. Evidence consistent with this has been documented when it comes to making choices about health insurance (McWilliams et al, 2011). This is one of the reasons for the development of design choices and decision aids, to help consumers make decisions on the *healthcare.gov* health insurance marketplace in the United States (Wong et al., 2018). By doing this, the 'choice architecture' is improved in the face of complexity and information overload.

We face many additional constraints on behaviour. Decisions are shaped by social and cognitive beliefs (Hoff and Stiglitz, 2016). Beliefs play an important role in constraining or stimulating certain behaviours, when related beliefs affect the subjective value of that activity. Think, for example, of the links between vaccine hesitancy and group distrust of a particular government or industry. Similarly, social constraints such as social norms (or what is commonly done or even what is acceptable for 'people like me') and social stereotypes are influential over actions. These affect our identity (sense of self compared to others) and perceptions of belonging, although not everyone reacts to such social stimuli in the same way.

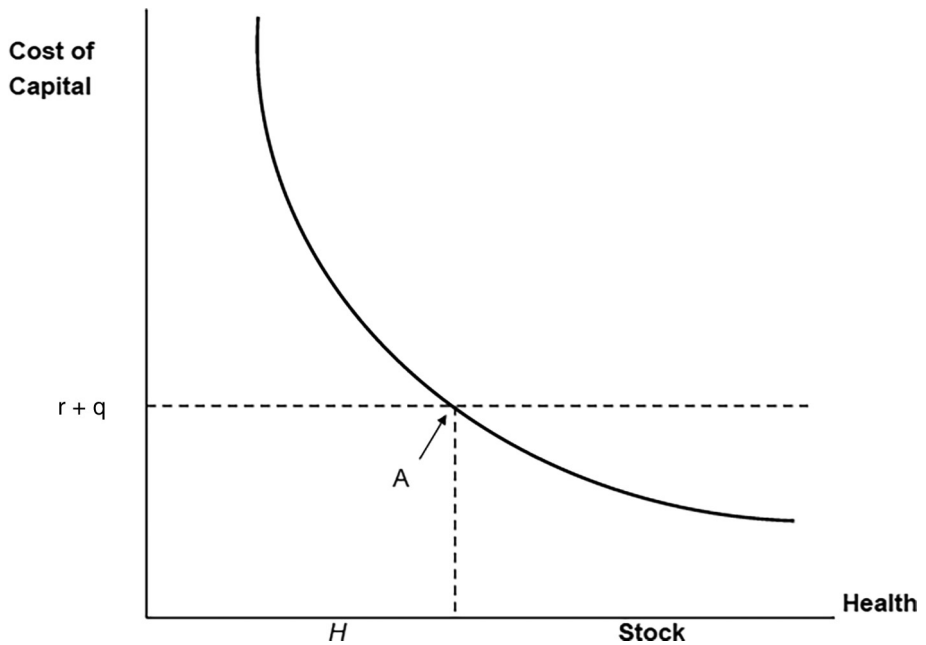
## 1.5 Health Investment Models and Its Limits

The seminal Grossman (1972) model depicts health investment as the result of the health capital stock with which someone is born and their engagement in 'healthy investments' (attempts to avoid ill health in order to remain in income-generating work). We made decisions based on our initial health endowments  $H_{t-1}$ , and add to this by investing in health, perhaps by going to the gym, eating our 'five-a-day'<sup>3</sup> or consuming preventative care. Of course, the model also allows for health to depreciate (at a rate  $d$ ), particularly as a product of ageing.

Health is improved if people invest ( $I_h$ ):

$$H_t = H_{t-1} - H(d) + I_h$$

<sup>3</sup> Five-a-day is the slogan of national campaigns to encourage the consumption of five portions of fruits and vegetables per day.



**Figure 1.1** Optimal health investments

Nonetheless, health, as part of our human capital, can help increase income. That is, in addition to improving well-being (a consumption effect), it brings returns through higher income by reducing absenteeism (investment effects). These are very tangible returns, but disinvestment or a failure to invest is also possible, producing negative returns for well-being and income. Within the Grossman model, health expands with the reduction of the costs of ‘healthy investments’, namely with a lower cost of time ( $q$ ) and money ( $r$ ). People maximise the present discounted value of lifetime utility. So optimal choices will result from finding the level of health investment ( $A$ ) where the cost of investing in health compensates the lifetime value of better health as depicted in Figure 1.1. That is, the optimal investment results when the marginal cost of investing in health (in terms of time and money) equals the marginal benefit (in terms of additional healthy days produced and enjoyed).

Beyond this simple model, one can argue that health decisions are also influenced by beliefs; returns to health investments may well be more important to some than health. They may be influenced by social perceptions; people surrounded by healthy eaters are less likely to enjoy unhealthy eating (at least in public). Some will have direct experience of poor health and become somewhat accustomed to its ill effects on life, or vice versa. We will discuss these variations in understanding the risk and benefit calculations underpinning investment in health decisions, and in other domains, in Chapter 2.

Decisions may also deviate from rational optimality because of the influence of emotions, personal optimism about the future or by individual conceptions of time. It is important to expand our view of health investment decisions by considering



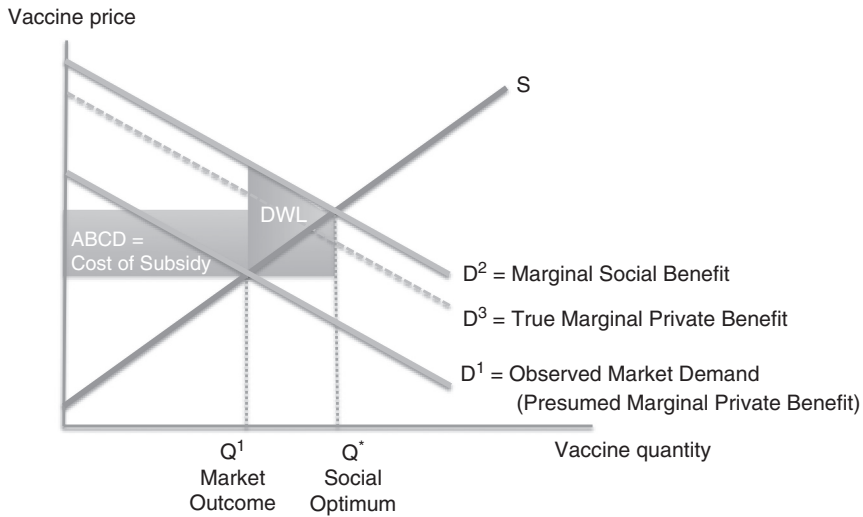
cognitive limits, caring about others in their social environment, making choices influenced by emotions, possessing limited self-control and being unable to fully assess future states of utility or disutility. This is the very human individual we will now concentrate our efforts on in this book.

## 1.6 Behavioural Incentives

The individual of behavioural economics is one whose preferences can be swayed by social environments and the pursuit of social incentives (e.g., status, esteem, identity in addition to their own self-interest). They have self-control limitations and face cognitive constraints on their ability to foresee the long-term consequences of their actions. Compared to the 'homo economicus' of introductory economic models, it is a 'weak individual' whose actions can be driven by emotions and for whom acting rationally is not the result of the maximisation of a stable payoff function (e.g., utility). They are driven by the pursuit of short- or medium-term goals. We could describe this as some sort of 'ecological rationality', still quite rational but only after taking full account of the many behavioural constraints with which they are beset. Self-interest is not their only goal. Individuals consider others as part of their own objective function. That is, they exhibit bounded rationality (cognitive limitations) and limited willpower (choices differ from goals). They use handy decision shortcuts (heuristics), so they do not pay attention to less salient dimensions of decisions, attach great weight to the information that is most salient or most readily available to them, favour today over tomorrow (present biased) and more generally make decisions subject to numerous and systematic deviations from simple rationality, which we regard as cognitive biases.

The goal of behavioural economics is not just predicting behaviour, but also to describe and explain behaviour, so we can design relevant policy recommendations. For us, the 'one size fits all' description of the standard model undermines its value for either normative (how people should behave) or descriptive (how people do behave) use, without considerable enhancement by the findings of behavioural economics. Individuals do update their information in non-trivial ways. Incentives defined to motivate this human person are very different from the universally applied standard incentives of introductory economics that disregard the cultural and social environment. Individuals are embedded within a social environment. We therefore need to define a more complex rationality driven by the deep preferences that result from the environments within which we exist. Religions and cultural events shape how people act and how they perceive choices. When we change one behaviour, this may lead to changing another, either to complement the new behaviour or compensate for it. For example, preventing smoking in public spaces may reduce smoking by making it less convenient and may reduce the smoker's visits to a bar, but it may also increase the consumption of junk food or influence their children to smoke by increasing smoking in the home. We will come back to these so-called behavioural spillover effects in the next section.





**Figure 1.2** Market failure under positive externalities  
Source: (Madarian, 2014)

The relaxation of the simple rationality assumptions of economics in behavioural economics is guided by the consideration of what some call ‘evolutionary rationality’, namely the acknowledgement that some cognitive biases recognise behaviours that have an ‘evolutionary logic’ (Wilson, 2015). Our behaviour is shaped by millions of years of evolution and cultural persistence, but our memories are driven by our short lifetime experience. Rather than following a simple rational path, our decision-making is the expression of a reaction to complex environments we often struggle to grasp (Gigerenzer, 2008). For instance, loss aversion (a preference for avoiding losses to acquiring equivalent gains) regarding food supplies might be the optimal strategy for people to follow when there is a significant risk of impending famine. Business marketing campaigns have long aimed to exploit our behavioural biases, often in ways that create or exacerbate market failures. One role for the use of behavioural economics in policy is to design incentives to counteract such marketing tactics, sometimes known as ‘counter nudges’.

Once the ‘broad tendencies’ of individual behaviour are identified, which we broadly define as ‘cognitive biases’, it is possible to design behavioural incentives that support more beneficial behaviour amongst those who are adversely affected, and perhaps counteract the abuse of such biases by profit-seeking firms. Of course, we must recognise that people are amenable as individuals to particular biases.

A vaccination campaign designed to work on social incentives by reminding people of others vaccination uptake can have a similar effect to a financial incentive (Madarian, 2014). This is described in Figure 1.2 where it is shown that only  $Q^1$  non-incentivised individuals would vaccinate, but if they understand the true benefits of taking a vaccine, their vaccination would become close to the social optimum ( $Q^*$ ), reducing the dead weight loss (DWL). A similar, but more expensive outcome could

be achieved subsidising vaccinated individuals at the cost of ABCD. This research became very relevant during COVID-19 pandemic, and after several vaccines were launched as such behavioural interventions were put to widespread use, alongside or as an alternative to financial incentives and mandates. Later in the book (Chapter 8) we will make the case why subsidies are not necessarily an appropriate policy choice to increase vaccination for COVID-19 in particular, due to the risk that the signal of a financial reward can be interpreted in several ways (Cryder et al., 2010).

## 1.7 Behavioural Regularities

Individuals are subject to *common behavioural patterns* which we will call ‘behavioural regularities’. However, behavioural incentives should take into consideration a whole host of these behavioural regularities that steer behaviours.

### 1.7.1 Cognitive Biases, Frames and Defaults

As behavioural economics has developed, it has incorporated a long, and still growing set of behavioural regularities, and we will endeavour to explain some of these, which are of great importance to any consideration of behavioural incentives for health. Probably the most important behavioural regularity that jars with introductory economics is the observation that *framing matters*. Choices framed as either a gain or a loss are not equally perceived (‘loss aversion’). Typically, losses loom more heavily than gains. This is an important consideration when deciding how to communicate health information, and the stress placed on losses or gains. Timing is part of this framing too. Whether framed as a loss or a gain, the timing of a decision matters. This is why *prompts and reminders* play a role in behavioural interventions. Whether or not an option is the default also impacts on decisions, as it takes more effort to break from a default, which is usually the status quo (when no change is an option). The determination of the *default option* is another particularly powerful steer. It can set a reference point against which a decision is judged, and define the status-quo against which potential choices are mentally framed as losses or gains. A popular example in health policy is that of presumed consent in organ donation after death. An opt-out scheme in which the default position is that everyone is on the donor register will deliver a much larger register than an opt-in scheme. The sheer power of this means that it really does need to be handled with great care.

Aspects of the choice architecture such as the images and colours used in messages, the specific words and language used can influence decisions in one way or the other. This can be of particular interest in the framing of clinical guidelines in health, in media used to remind patients to take their medication, of the disclosure and consent forms patients are required to complete as part of their care programme. References to *social norms* are another powerful tool in framing decisions, as we will often follow what we are told ‘most people’ do or what our role models do.

## 1.7.2 Tipping Points

A second broad category of behavioural regularities relates to *tipping points*. These might be events that carry catastrophic consequences, cultural associations or exceptionality that their occurrence becomes a ‘before’ and ‘after’ framing. Respective examples of these types of tipping points might be a major terrorist attack, turning 30 years of age or the COVID-19 pandemic. There is a before and after psychology that can affect decisions. Tipping points can also derive from more continuous events, gradually escalating until some point of mass change arrives. This is often the case with social norms, when a point is reached where the dominant norm collapses (Sunstein, 2019). Norms emerge for a purpose and also change for a purpose (Margalit, 1977).

A ‘critical’ point can create rapid and dramatic changes in behaviour. This generates a new cascade, in which there is widespread adoption of a previously rare practice (Bandwagon process). This can explain ‘social epidemics’, the dynamics of segregation by ‘white flight’ (Shelling, 1971) or drug use amongst adolescents, for example. Reactions to the 2009 H1N1 pandemic produced some lasting effects on hand washing behaviours. Gastrointestinal diseases and health shocks such as disease outbreaks can operate as ‘natural nudges’, altering the risk perceptions of individuals. Finally, it can be argued that the COVID-19 pandemic might have been a tipping point for some to start using digital health care.

## 1.7.3 Social Influences or Network Effects

A third feature defining the individual of behavioral economics is that it falls prey to social influences. If one person’s smoking influences their neighbour’s tendency to smoke, then a smoking ban in public places may have both a direct effect and an indirect effect through its social influence: Measured as the ratio of aggregate coefficients to individual coefficients, such effects is known as ‘the social multiplier’ (Glaeser et al., 2003). Individuals who socialise in a group tend to be influenced by the preferences of that group. Experiences of food poisoning of a small number within a group can propel the behaviour of the rest of that group; beer drinking in university student societies influences the behaviour of all in the society. Narratives matter too. When an event is labelled a catastrophe, it provides a case for a stronger policy reaction. Similarly, the World Health Organisation labelling rising obesity rates as an ‘epidemic’ even though it is not classed as a contagious disease, affects the salience of the problem, and justifies the need for intervention.

However inconsistent we may be in practice, we do strive at consistency with commitments. This means that anything that is somehow framed as a *contract or commitment* possesses behavioural power. The sunk cost of up-front gym memberships may work as a commitment device, as would a pledge amongst a group of friends to give up sticky buns. When we do have an *audience to provide feedback*, this peer pressure generates a social cost of failure (fear of rejection and shame). Similarly, social incentives for behaviour can be influenced by initiatives that link to ‘health

identities' and norms. Exercising with partners, friends or work colleagues creates a social proximity, which in turn links to *esteem*, self-image and the social reward from being observed engaging in approved behaviour.

#### 1.7.4 Behavioural Spillovers

Finally, we should return to the crucial consideration of behavioural spillovers. These arise when a behavioural incentive results in behaviour change beyond what is being targeted. Smoking increases spousal smoking (Fletcher and Marksteiner, 2017; Cutler and Glaeser, 2010), and evidence also suggests positive spillovers on spouses from clinical interventions tackling smoking and drinking (Fletcher and Marksteiner, 2017). Given that behaviours are often connected, policy interventions may exert both negative and positive effects on other behaviours (Thomas et al., 2016; Truelove et al., 2014). For instance, if decisions are substitutive, behavioural spillovers might give rise to 'licensing effects' (e.g., drink more, exercise less), which means that individuals adjust other behaviours because of changing some specific behaviour (quitting smoking): I can eat an extra high-calorie treat because I have burnt a few calories on the treadmill. Similarly, such negative spillover effects have been observed in explaining environmental behaviour (e.g., recycling) to reduce the guilt of exerting non-environmentally friendly behaviours (e.g., driving). I drive an electric vehicle; therefore I drive more and walk less free of the guilt of emissions. Such spillover effects are rooted in 'compensatory beliefs'. These explain why dieters often undertake inconsistent behaviours when their behavioural goal of healthy eating conflicts with the pleasure they gain from eating. Any designer of behavioural incentives who ignores behavioural spillovers may be heading for disappointment.

#### 1.7.5 Behavioural Change

Although behavioural regularities can be identified in natural and experimental settings, the use of such information to re-design incentives for public policy is not always obvious given its complexities and variability by context. The first and most important step is probably to look at the environment itself, the existing 'choice architecture' around decisions. The framework for assessing and altering the structural influences on behaviour is probably the most important contribution of behavioural science to practical intervention. The choice architecture includes many 'natural defaults', which predicate in favour of certain behaviours unless we consciously decide to follow another path. Defaults are all around us and have usually been generated by no particular process of determination or design. It is just 'how it is'. Opting out entails a cognitive effort, and often a strong will to overcome peer pressures and other psychological and practical barriers to change. The 'nudge agenda' (discussed in Chapter 5) focuses on this all-pervasive but often unremarkable 'choice architecture'.

The architects of 'nudge' describe the approach as one of 'Libertarian Paternalism'. They argue that a true nudge will 'make people better off, as judged by themselves' (Thaler and Sustein, 2008). That is, nudges 'guide people's choices' towards the option that is judged most beneficial to them, whilst always maintaining their freedom of choice. In such contexts, the individual's choice architecture is arranged such that

they can be faithful to their own ‘true’ preferences, often called their ‘first order preferences’ in order to distinguish them from the lower order preferences that shape daily life. This implies that individuals hold some antecedent preferences. If this holds true, then the person’s future self would one day thank the choice architect for keeping them on their own desired path, not being knocked off course and inflicting avoidable harms to themselves, known as an *internality*. Nudges it is argued, simply help individuals do what they would have done if the future self was in control of their decisions. In the real world, however, behavioural approaches are used to achieve the choice architect’s policy goals.

These alternative uses of behavioural insights range from nudge-like policies perhaps with slightly wider goals than pure internalities to moderately coercive tactics (perhaps a less-than-easy opt-out from a default) to full-force bans or mandates. LeGrand and New in their discussion of state paternalism differentiate between a soft paternalism in which the state intervenes as a ‘helpful friend’ and the hard paternalism of a ‘nanny state’ (Le Grand and New, 2015). Hard paternalistic interventions would include mandates and regulations that restrict freedom, by restricting the choice set of individual’s actions. Such actions, even when behaviourally informed, have much in common with traditional incentives that limit the consumer choice set. Examples are compulsory medical insurance or vaccination, bans on euthanasia or soda taxes. Mandates often go together with fines or other penalties imposed on anyone who breaches the rules.

In some circumstances, regulations do also have additional secondary effects on behaviour, perhaps by signalling societal approval or disapproval of an activity or product, or by generating a new social norm once most people are seen to comply with the rule. In Chapter 7, we will discuss the potential spillover effects that can emerge from new regulations.

Taxes too can be a form of hard paternalism if they are large enough to directly affect the available choice set, and not just a gentle signal. Governments have long used ‘sin taxes’ placed on activities or goods that cause harm to others, known as ‘externalities’. In economics, these are known as Pigouvian taxes. The most popular with governments are, however, often those with effects on behaviour that punish harm but still raise revenue. Fuel, alcohol and tobacco taxes are some of the best examples. Subsidies are an example of reverse taxes, where the government allocates funds, perhaps to certain target groups, to incentivise desirable behaviours.

In a more soft-touch or complementary approach to regulatory action, communication channels can be used to generate social incentives that encourage or discourage particular behaviours. These may offer rewards or penalties that are entirely social. These can be powerful forces, although they also carry risks causing real harm or even being counterproductive by stigmatising activities or groups in society, if used without careful consideration.

## 1.7.6 The Uniqueness of Health and Healthcare Decisions

Health and healthcare decisions are different from many of the decisions people face in other domains. Indeed, health choices:

- often entail an investment component that provides long-term but uncertain returns.
- carry high stakes, even life and death. Choices are taken within a highly emotive environment.
- tend to be time sensitive, often with a small window in time in which to make the decision. We are mostly subject to ‘projection bias’ (Loewenstein et al., 2003), assessing future health preferences on an assessment of our present health preferences.
- are infrequent for many people. Health systems tend to have a small number of frequent users, but many with very little interaction. Many are, in effect, naïve ‘first time consumers’ when a personal health crisis arrives. This is fertile ground for biased decisions based on personal anecdote or news headlines.
- are shaped by trusted agents. Decisions are steered by experts. The way they frame options affects choices.
- are often taken in a period of weakness, so decisions may be taken variously in an unusually ‘hot’ or ‘cold’ emotional state.

A behavioural approach to health choices recognises these unusual influences on decisions, which seem to stray from the standard assumptions of rationality. Such an approach helps address the behavioural anomalies seen in health: Why co-payments don’t always work as intended? Why people do not insure or save for their later life care needs? Why wellness programs in the workplace often does not have the outcomes expected? How to reduce overutilisation of emergency medicine care? How to improve the self-management of chronic disease? How best to support public willingness to donate time and money to health needs? How to improve the take-up of free services? How to improve the use of clinical guidelines? There are just so many behavioural oddities in health, with serious implications for the quality of lives and performance of health systems.

### 1.7.7 Misconceptions and Ethical Concerns

The many behavioural quirks in health mean that it differs significantly from the ideal of a functioning free market of introductory economic texts. It is almost a universal truth that the state plays a major role in health regardless of cultures and ideologies.

Behavioural incentives are interventions, intended either to build on behavioural regularities in order to achieve a defined goal, perhaps to prevent harm to others (externalities) even though this may not be rational in egoistic terms, or to help people act more rationally in terms of harm to themselves (internalities). Both are cases of state intervention, although the latter may be more controversial than tackling market externalities. Markets work if contracts are complete, and prices reflect all relevant information including quality. For the reasons mentioned above, this simple mechanism is unreliable in health, which is beset with market failures. Prices are often relegated to second-order decisions, with prices often discussed only between providers and third-party payers (health departments or insurers). Quality is not directly observable by the patient. Whilst insurers and payers require specific quality standards to be

reported and, in some cases, benchmarks to be met for reimbursement, prices faced by payers do not necessarily reflect differences in quality. It is unclear how users trade off different dimensions of care quality and many are hard to quantify.

This observation should not be taken to mean that behavioural economics is an argument for more state intervention. Policymakers are not immune from behavioural regularities, and *behavioural political failures* are easy to spot (Hallsworth et al., 2018). Political processes are heavily affected by biases, particularly a short-term world view driven by electoral cycles. The role of emotions, prejudice, status and identity might be even more important in politics (Stigler, 1982) and evidence shows that even beauty can matter to electoral success (Berggren et al., 2010) and leadership stereotypes (Bauer, 2020). Therefore, behavioural economics is not arguing for a more active role of the state in healthcare decision-making either. Anyone who determines to use behavioural incentives on others needs also to consider their own behavioural regularities as they do so.

Behavioural economics is also open to criticism on ethical grounds. Particularly when applied to health, it can lead to strongly paternalistic interventions based on beliefs of what is best for another person's well-being. Nudge approaches in changing choice architecture may be invisible to those being nudged. In Chapter 12, we will discuss frameworks for behavioural policy designed to prompt careful consideration of ethics as an integral part of the behavioural policy process.

Nonetheless, one of the strongest arguments for state paternalism and countering some of the concerns over the ethics of behavioural policy is that our behavioural regularities are used routinely by non-governmental groups. We are bombarded with messages encouraging us towards unhealthy diets, to spend today rather than save for tomorrow, or to lock us in to bad habits, or buy more of a product than we otherwise would. Companies routinely take advantage of the friction that constrains our decisions and make it hard to do what is good for us. Richard Thaler calls this type of dark nudge 'sludge'. Decisions are rarely taken within a completely neutral environment. The case made for 'libertarian paternalism' is that if there must always be a choice architecture, then it is best that these environmental factors are moulded in the way that seems most likely to support choices beneficial to well-being.

## 1.7.8 Social Determinants of Health

A valid criticism of the development of behavioural incentives is that they will tend to concentrate on individual behaviours, when socio-economic circumstances are crucial factors in health. There is a real risk that people are stigmatised by behavioural incentives, for example, in the use of messages based on social norms around 'good' behaviour. The social determinants of health (housing, education, early life, food insecurity) have a much greater role in health outcomes than health care (Braveman and Gottlieb, 2014). It is arguable that an excessive focus in behavioural



economics on individual decision-making, means that a large portion of the causes of health-related behaviour are neglected as are the constraints on autonomy experienced by people in poverty (Burchardt et al., 2015). Similarly, some argue that health problems such as obesity are better tackled by system (rather than individual) level interventions (Chater, and Loewenstein, 2022).

### 1.7.9 Methods of Behavioural Health Economics

Evidence testing theories and interventions in behavioural economics have emerged from multiple sources. Many theories have been developed from pure observation of individual behaviours in a variety of contexts.<sup>4</sup> Some of these have been controlled experiments whilst others have occurred quite naturally. A controlled experiment might take place in a laboratory or in the field. In a controlled experiment, the researcher is designing and running a study, with the optimal approach being a randomised controlled trial, as used for many years in clinical research, across randomly assigned ‘treatment’ groups and a non-treatment ‘control’ group. In a natural experiment, effects can be identified by events that happen in society, perhaps due to a policy change or exogenous event. Often a natural experiment will develop when a policy change is made in one location but not in another, thus allowing comparison between cases before, during and after the change.

All these methods have advantages and disadvantages and have played important roles in the development of behavioural economics.

*Laboratory experiments* allow for internal validity as they manipulate the conditions under which individuals behave but have limited external validity. This means that whilst a behaviour change may be observed in the lab, it may not reflect what would happen outside of the lab, or their effects may ‘lose considerable voltage when scaled’ (List, 2021).

*Field experiments* take place in the ‘real world’, and hence might be influenced by other non-controlled factors such as specific features of the environment (e.g., school, hospital, weather or economic events), where the intervention is tested. Hence, they might have less internal validity than laboratory experiments, but they produce data that has external validity for the population to which they refer. Evidence is generally interpreted as causal if there is no selective attrition, but most field experiments carry limited external validity and are non-representative of larger populations. Such experiments are being used in health economics as a source of evidence. The Oregon and the RAND experiment (which we refer to later in the book) are well-known randomized experiments in the analysis of health insurance that offer seminal findings to the field of health economics.

Behavioural economics draws on a long list of data sources shared with standard economics. These include quasi-natural experiments and policy interventions, as well

<sup>4</sup> However, we must be cautious and pay special attention to the quality of data. An example was during COVID-19 the recommendation of taking hydroxychloroquine, as initial observational data initially suggested evidence of beneficial effects individuals who have COVID-19, and even though it turn out not to be true.

as evidence from causal econometric techniques that identify similar variation that is as good as random. Many studies rely on survey data. These can be developed quite readily and at low cost on web-based platforms when they would historically have been undertaken by telephone or post. Web-based surveys lend themselves to the use of video representation of reality and can be used to elicit hypothetical and real choices. Questions and information provided can be randomised, and prompts varied between respondents as part of study design.

A long list of data sources contains relevant information to test behavioural theories; administrative datasets, panel surveys, social media, Internet search data and more recently ‘big data’ using algorithms to process and derive meaning from very large sets of real-life observations. Such data are typically considered externally valid for the population they cover. If that population is sufficiently large and representative, this increases the robustness of any results produced. Big data and associated mining algorithms can, however, be ‘noisy’, which still creates a need for caution in interpretation.

By its nature, behavioural economics is inclined to draw on multiple sources, including other scientific disciplines. Note, for example, the relatively novel field of neuro-economics, in which reactions to experimental scenarios can be measured by brain scanning (Sawee, 2019). Given the strengths and limitations of each source of evidence, behavioural economics tends to rely on a mix, often testing theories and findings across different populations and methods. Credibility depends on whether the evidence sheds light not only on the outcomes of an intervention but also on whether causal mechanisms can explain the outcome.

## 1.8 What We Know and Where We Are Heading

Humans are not rational calculating machines, consistently maximising some well-defined function. They are much more interesting than that. Humans are emotional and make great use of cognitive shortcuts, particularly when faced with complex decisions, uncertainty or unfamiliar choices. As behavioural economics has developed, it now seems obvious that health economics would follow this more human route, engaging in multi-disciplinary analysis with psychology, sociology, anthropology, geography and evolutionary biology.

It is arguable that behavioural economics has helped open new doors to policy impact for research in multiple disciplines. It has generated interest in policies that work, and in experimentation within the policy process. The fact that low-cost or no-cost changes in choice architecture, perhaps in the wording of an email or a web page, can produce as much impact as more costly initiatives have made the use of behavioural incentives a particularly attractive policy option. They also help policymakers reduce the need for unpopular instruments such as taxes or fines. Over time many policymakers have come to appreciate ideas of rationality that are closer to evolutionary rationality or quasi-rationality in which a broad set of factors plays an important role.

However, whether behavioural economics has managed to deliver on its promises will long be debated. The big challenges usually lie in shifting *long-term* behaviour and habits or complex behaviours, whereas many interventions have tackled relatively simple problems with short-term wins. A good example relates to organ donation. A simple change of default will deliver the policy ‘win’ of more people on the donor register. Obtaining consent from bereaved relatives at the time of death is a much more complex problem, but a genuine barrier to increasing the number of organs available for transplant. It may be easy to incentivise someone to attend the gym during an experiment that lasts six weeks, but much harder to build an exercise habit that lasts when the experiment ends.

Models of how people learn and how they form expectations that exist in the psychology or sociology literature have perhaps not been integrated into the wider policy or incentive design framework. The rise of behavioural economics has generated much excitement (and a few Nobel prizes) but we need to ask ourselves whether it really does better than standard economics in three dimensions: (i) predictive capacity; (ii) generality (context specific theory) and (iii) tractability (easy to understand with limited effort). John List (2021) identified multiple concerns around use of evidence generated by behavioural economics: Studies have tended to be quite limited in scale and number, whereas inferences draw upon several well-powered studies. These studies also tend to consider specific populations, which can be unrepresentative of the population to which a behavioural incentive influenced by the study is applied. One of the core messages of behavioural science is, after all, the warning that ‘context matters’. The early tendency towards quick wins in behavioural policy applications has meant that spillovers on other behaviours, or what some call ‘general equilibrium effects’, were neglected.

Over the decades, the focus of behavioural economics seems to have moved in a series of waves. The first of these waves was defined largely by the identification of behavioural anomalies, delivering a crashing critique of the rationality assumptions in standard economics. The second was the incorporation of these anomalies into the theoretical model, testing their intensity, validity and reliability. Without stretching the metaphor too far, the third wave feels to be breaking more gently onto the beach of mainstream economics. We are seeing the on-going incorporation of behavioural models into the (health) economics mainstream because of the reach of health economics. Health economics has been one of the pioneers in the incorporation of behavioural economics. (The other pioneer has probably been financial economics, as questions were raised after the global economic crash of 2008.) In the following chapters, we will be setting behavioural economics within health and healthcare policy contexts, discussing its successes and limitations, and prioritising ideas and policy applications.

## 1.9 Questions to Ponder

1. Why might loss aversion make sense when making a decision over health? Think about some practical examples.
2. Why do New Year Resolutions rarely last, and why do we keep making them?