



Sustainability of Publicly Funded Health Care Systems: What Does Behavioural Economics Offer?

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Abstract

There has been a rapid increase in the use of behavioural economics (BE) as a tool for policy makers to deploy, including in health-related applications. While this development has occurred over the past decade, health care systems have continued to struggle with escalating costs. We consider the potential role of BE for making improvements to health care system performance and the sustainability of publicly funded health care systems, in particular. We argue that the vast majority of applications in this field have been largely focussed on BE and public health, or the prevailing level of risks to health in populations, and with policy proposals to ‘nudge’ individual behaviour (e.g. in respect of dietary choices). Yet, improvements in population health may have little, if any, impact on the size, cost or efficiency of health care systems. Few applications of BE have focussed on the management, production, delivery or utilisation of health care services per se. The latter is our focus in this paper. We review the contributions on BE and health care and consider the potential for complementing the considerable work on BE and public health with a clear agenda for behavioural health care economics. This agenda should complement the work of conventional microeconomics in the health care sector.

1 Introduction

The use of behavioural economics (BE) as a tool for policy makers has rapidly increased over the last decade, with governments introducing BE teams to inform policy proposals for a range of activities across various sectors of the economy, including the health sector [1, 2]. We consider the potential role of BE in improving health care system performance and the sustainability of publicly funded health care systems. We focus exclusively on health care—as opposed to more general ‘public health’ interventions—and the role that BE has played, and could play, in attempts to improve the efficiency and sustainability of health care systems.

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Key Points for Decision Makers

Behavioural economics (BE) offers insights that complement those from traditional microeconomics, including health economics.

The main insights of BE come from observations of the cognitive biases that may lead people to make choices that are inconsistent with their ‘deliberative preferences’.

While there is evidence that policy makers are generally supportive of BE measures, such as ‘nudges’, the literature on their application to foster health care efficiency is small.

Considerable opportunities remain for economists to explore applications of BE to provider and consumer behaviour in respect of health care where there is evidence of cognitive biases in decision making.

However, structural problems giving rise to incentive incompatibilities may underlie the challenges of efficiency and sustainability for which BE offers little if any help.

To do so, we start with a clear statement of what BE is and is not and how governments' BE teams have at times been distracted by policy proposals that fall outside the BE framework. We then draw on existing literature to identify the determinants of health care expenditures within publicly funded health care systems and review the use of BE in the health economics literature. We note that most applications largely focus on public health, or the level of risks to health in populations, with policies aimed at 'nudging' the behaviour of consumers or producers. A well-known example of the former is work on the influence that 'positioning'—either in physical layout or in menu ordering—has on choices over healthy and unhealthy eating options (see Meng and Chapman [3] for a review).

Few applications of BE, though, have focussed on the management, production, delivery or utilisation of health care. As a result, effective policies in the areas of public health, while potentially improving population health, do not offer solutions for funders, managers or providers of care trying to contain costs in health care systems. Instead, because health care systems are largely 'supply driven', changes in population health, whether through nudging policies or otherwise, merely result in different uses for available resources, whether through means of supplier-induced demand or other mechanisms. We review the small literature on behavioural health *care* economics and attempts to change the behaviour of providers, managers and planners through 'nudges'. In the penultimate section of the paper, we consider the potential for complementing the BE of public health work with the BE of health care, and we provide our conclusions in the final section. We argue that BE interventions, or policies based on them, may hold promise for the improvement of health care efficiency. Yet it seems unlikely that BE interventions will ever prove to offer the grand solutions that health care systems worldwide are seeking in respect of reduced health expenditure growth and greater efficiency. Rather, we believe that the insights of conventional microeconomics concerning, among other things, the influence of structural features and incentives on the conduct and performance of producers and consumers are likely to be quantitatively more important to health care efficiency than are new insights from BE. Similarly, in policy formulation, the allure of simple and low-cost BE-based policies (e.g. nudges) will, in general, likely be less effective than politically costly policies (e.g. taxes) that affect prices or quantities directly.

2 Behavioural Economics: What It Is and Is Not

According to Simon [4], BE is dedicated to (1) empirical tests of the neoclassical assumptions about human behaviour, (2) exploring the implications of departures from those

assumptions for institutions and public policy and (3) supplying empirical evidence on the "shape and content of the utility function" to strengthen the predictions about human behaviour. In these ways, it combines "the economics of incentives with insights from psychology about how people actually behave in the real world" [5] (p. 433).

Important outcomes of BE are policy prescriptions that have been framed as "libertarian paternalism" [6]. Some [8] have noted the apparent contradiction of trying to balance liberty with paternalism but have also noted that BE may be used in a way that is more consistent with traditional welfare economics while also recognising that individuals' choices sometimes contravene rationality assumptions.¹ Proponents of libertarian paternalism argue that the term is not, contrary to critics' claims, an oxymoron [7] and argue for policies that change behaviour in ways that benefit those whose behaviour is changed (by removing 'negative externalities') without imposing substantial costs on others (negative externalities) [10]. The concept of an externality is analogous to the economic concept of an externality, except that the effects of the consumption decision are borne directly by the individual rather than imposed on others. Negative externalities, for instance, arise when an individual fails to take account of some of the costs or benefits of a consumption decision at the time of consumption [11]; for instance, the decision to try an addictive drug may be accompanied by a negative externality *if* the consumer does not take into account the potential for addiction in the consumption decision.

BE-based policies that are designed to align individuals' consumption decisions (or 'intuitive preferences') with their 'deliberative preferences' (i.e. preferences they have for themselves in the long term) [12] have been characterised as "soft paternalism" [13]. Sunstein and Thaler [7] (p. 1159) argued that it is "... both possible and legitimate for private and public institutions to affect behaviour while also respecting freedom of choice." Others have noted that private firms have long succeeded in using such strategies to sell products such as tobacco that cause harm to consumers [14]. Vlaev et al. [15] argued that "choice architects" (including those in the private sector) "... will always be shaping decisions whether people like it or not" (p. 557). This does not resolve the questions of how the opposing forces of liberalism and paternalism are to be balanced² or how the presence of externalities is to be adduced empirically outside the laboratory.

¹ Libertarian paternalism is not the only normative proposition that has arisen from BE. For a recent critique and contractarian proposal, see Sugden [9].

² Nor do they resolve how the paternalist is to *know* the preferences of the decision takers. Such broader philosophical matters are beyond the scope of the current paper. Applied BE essentially proceeds on the assumption that such questions can or have been resolved or are unimportant or that positive net social benefits may be assumed when some balance is struck between liberalism and paternalism.

Table 1 Sources of cognitive bias

Present bias	Stronger weight is given to pay-offs that are closer to the present
Probability weighting	Probabilities are weighted in non-proportional ways
Loss aversion	Losses are weighted more heavily than equivalent gains
Peak end evaluation	Experiences are judged based on feelings at the peak and end of the experience, as opposed to over the entire experience
Motivational crowding	Extrinsic incentives undermine intrinsic motivation

BE seeks to explain human behaviour through the lens of social preferences, heuristics and norms. Most findings of BE are characterised as the discovery of errors or biases in the means that individuals choose to fulfil their preferences [13]. More generally, the BE literature emphasises either limits to individuals' abilities to synthesise all the information pertinent to their decision making (bounded rationality) or of failures to act as they intended (bounded willpower) [16].

BE aims to *reshape the environment* or the “*choice architecture*” [15] so that individuals' automatic or ‘rule-of-thumb’ decisions are more likely to align with their deliberative preferences. This is pursued by encouraging, *not mandating*, individuals to behave in ways they would prefer over their current expressed preferences and in ways that impose minimal burdens on others whose behaviour is already rational (i.e. not the result of bias).³ Sugden [9] refers to this as the “free choice condition” (p. 367).

One example of public health research that investigates the effect of choice architecture on intentions is the work of Li and Chapman [17] on the framing of information and the human papillomavirus (HPV) vaccination intentions of consumers. The authors used two descriptions of an HPV vaccine, describing it as either “100% effective in preventing virus infections that cause 70% of known cases of a specific type of cancer” or, equivalently, as “70% effective in preventing virus infections that cause all known cases of a specific type of cancer.” They found that vaccination intentions were greater with the former description than with the latter. Thus, framing effects may ultimately affect decisions to be vaccinated.

Our delineation of what BE is underscores what therefore falls *outside* the remit of BE: BE is not about significant changes in financial incentives nor about changing underlying preferences because neither strategy addresses ‘bias’ in individual decision making. It is not about combatting market failure (e.g. negative externalities) for which neoclassical economics provides practical solutions. Hence, advertising, taxes and subsidies all lie outside of BE. Neither is BE about *regulating* behaviour, as individuals are free to change or

not change their behaviour in response to nudges, without sanctions or burdens being imposed on people who do not change their behaviour. All these strategies have been used to correct market failure associated with externalities. They do change behaviour but not expressly via addressing internalities. Of course, conventional economic policies such as increasing taxes on harmful products may give rise to the same outcome, but they should not be confused with BE initiatives that (1) target internalities and (2) do not restrict or try otherwise to change deliberative choice.

BE may be viewed as addressing individuals' failures to act in their own best interests as seen by themselves, after deliberation. BE explores how the choices individuals make are not the result of rational deliberative decisions based on expected utility maximisation but instead emerge from numerous sources of *cognitive bias*. Tversky and Kahneman [18] define a “baker's dozen” of them, and a rich literature has developed around them (see, for example, Kahneman [12]). Table 1 provides a brief description of five commonly discussed sources of cognitive bias in individual decision making.

Both experimental and observational studies play an important role in BE, and empirical tests of the predictions of BE in health are important if concerns about the nature of experimental evidence—particularly their external validity—are to be resolved. In practice, it is usually either difficult or impossible to ascertain (from observational data) whether the choices individuals make are affected by various sources of cognitive bias (i.e. whether or not internalities are at work).

3 Behavioural Economics and Health Care

A scoping review was conducted by searching for contributions on *health care efficiency* that invoke concepts from BE. Studies that were concerned with health, but not health care, were excluded. For instance, we defined papers on dietary choices due to changes in the choice architecture as out of scope but those that concerned choices about health care use (e.g. adherence to doctors' recommendations) as in scope. Importantly, we searched for BE articles concerning not only consumers but also providers and policy makers.

Our initial search (of EconLit and a list of eight selected multidisciplinary journals) used broad search terms to

³ In Sunstein's [13] terms, this definition of BE excludes “hard” paternalism and targeting “ends” rather than means. But not all discussions of BE explicitly exclude these types of policies from consideration.

minimise the chance of missing papers within scope. The initial search returned 468 records. Following abstract reviews, only 12 articles met the inclusion criteria; these were further reduced to seven articles following full review of the papers. We also added a further three citations (on nudging practitioners to give influenza vaccines—see later in this section) that we became aware of through the sources we originally reviewed.

Several of the included articles were concerned with the implications of BE findings for consumer choices over health insurance contracts (or influencing demand). Van Winssen et al. [19] considered the implications of BE for health insurance design in the Netherlands. Their work [20, 21] showed that only 11% of the Dutch population chose a policy with a voluntary deductible (VD) in return for a lower premium. Yet, 48% of policy buyers would—retrospectively—have benefited financially from the highest deductible policy. Almost 20% of buyers would have benefited from the VD in each of the preceding 5 years. They developed five strategies for increasing uptake of policies with VDs. The two most promising options were identified as (1) making VD the ‘default’ option in the choice architecture and (2) providing transparent information about the relationship between the policy premium, the VD and out-of-pocket costs. They argued that efficiency gains were likely from greater uptake of VD policies due to decreasing moral hazard caused by the deductible being more prevalent.⁴ This is consistent with BE literature on financial choices where default options lead to higher levels of uptake.

Turning to influences on supply, Oliver [22] considered performance management initiatives in the UK national health service (NHS) through the lens of BE. He asked whether the success or failure of initiatives designed to improve NHS efficiency may usefully be reviewed by considering insights from BE. He considered whether the initiatives—some financial and others not—were compatible with the postulates of identity economics [23].⁵ Oliver [22] argued that financial incentives may be blunted, ineffective or even counter-productive if they are not well-aligned with the ethos of medical practitioners and administrators. Furthermore, non-pecuniary measures such as league tables and naming and shaming may encourage better performance and capitalise on the loss aversion of professionals to whom status or standing is important. Nevertheless, these approaches may serve to demoralise ‘insiders’ whose goals are aligned

with that of the organisation but who are constrained by resource availability. Oliver [22] also argued that incentivised targets may lead to good non-incentivised practices being crowded out but noted that the evidence on this topic is mixed. He concluded that

... strengthening loss as a motivational lever is tempting, (but) it is advisable for policy makers to use blame ... guardedly. It is at least as important to make employees feel that they are motivated insiders—that they share a sense of identity with the institution in question—if one wants to get the best out of them [22] (p. 341).

Doran [24] (p. 351) argued that NHS incentives have focussed largely on process measures and have led to substantial quality gains on technical performance indicators. However, these were achieved at the expense of “trust, cooperation and benevolence.” He argued that deficits in those “indispensable [sic] virtues” will also undermine attempts to performance manage allied health and medical professionals. For these reasons, on balance, it is difficult to judge whether real improvements in the quality of health care resulted.

Vrangbaek [25] considered the problems associated with aligning performance management with objectives in complex, multi-product systems such as the NHS. She pointed to additional factors that give rise to senses of “programme management overload” and “programme management deficit”—both risk factors for inefficiency and demoralisation effects—that may not be mutually exclusive. The former can arise because of the imposition of (1) heavy demands on the time and other resources of those subject to performance management measures, (2) large numbers of contradictory evaluation criteria, (3) unreasonable expectations given resource constraints and (4) performance criteria prone to goal displacement or “subversive behaviour” (p. 368), particularly when key dimensions of performance are not included in the performance management framework.

Also focusing on providers, Holmås et al. [26] used a natural experiment with fines levied by hospitals on long-term care owners who prolong hospital length of stay to study “motivational crowding.” Motivational crowding occurs when extrinsic (financial) incentives crowd out the intrinsic motivation to behave in a particular (e.g. pro-social) way, creating adverse unintended consequences. The authors exploited re-drawing of catchments in Norway that re-assigned long-term care providers from the catchment of one large hospital that did not impose fines to the catchment of a hospital that did, and vice versa. They found that hospital stays were longer for the hospital imposing fines than for the hospital without fines and claimed that this provided evidence of motivational crowding. Clinicians have also emphasized the importance of a balance between intrinsic

⁴ van Winssen et al. [19] made several related points about the implications of BE for the choice architecture and menus offered in private health insurance markets.

⁵ Akerlof and Kranton [23] proposed that individuals experience positive utility from working for an organisation whose values they identify with and vice versa. The former are referred to as “insiders” and the latter as “outsiders.”

and extrinsic incentives and of the potential adverse consequences of failing to get that balance right [27].

Möllenkamp et al. [28] conducted a systematic review of nudges to improve patient adherence to recommendations. Focusing on 13 studies judged to be of moderate or high quality, nudges included reminders, feedback, planning prompts and small financial incentives. Only four studies considered changes in self-management outcome indicators (e.g. control of blood glucose level), of which one reported a statistically significant effect. Eight studies found nudges affected behaviour, but outcomes were not measured. They concluded that, while nudges may improve self-management, there is little evidence that these changes affect the target health outcomes.

Trujillio et al. [29] focussed on policy makers and practitioners, developing vignettes for a web-based international survey of 520 practitioners and policy makers. The aims were to elicit opinions on (1) health policy recommendations drawn from BE, (2) the applications of recommendations in low- and middle-income countries and (3) common themes of agreement and disagreement between them. They recruited their sample by emailing all 6535 subscribers to the Centre for Global Development's global health newsletter and achieved a response rate of approximately 8%.⁶ They reported strong support among respondents "... for health policies based on the concepts of framing choices to overcome present bias, providing periodic information to form habits, and messaging to promote social norms ..." but less support for the use of extrinsic financial incentives to encourage chronic disease management or to encourage less-risky sexual practices (p. 747). They argued that lack of support for cash rewards stems from normative concerns and perceptions that such measures are ineffective.

Another line of inquiry explored in a number of papers over the past decade is of the effect of prompting clinicians to either 'accept' or 'cancel' a vaccination request for an eligible patient through a semi-automated system (see, for example, Chapman et al. [30], Milkman et al. [31], Patel et al. [32]). Essentially, eligibility is determined when the patient makes a doctor visit and their doctor is prompted either to provide the vaccination or to 'cancel' it. In this way, the doctor is nudged to make an active decision. In fee-for-service contexts, it is not surprising that the intervention has been shown to work, as the incentives for the doctor to vaccinate accord with the public health objective of higher vaccination rates. Whether a nudge of this kind would prove as effective under other kinds of practitioner remuneration models (e.g., pure capitation) is debatable.

The BE literature we located on health care efficiency comprised a small number of papers looking at insurance plan choice among consumers, patient adherence to treatment protocols and the use of performance management policies and clinician nudges that relate to only a small and very specific area of individual bias in decision making. No attention was given to other areas of system performance such as the efficiency of service production or service distribution within populations. Moreover, the studies are partial in nature, inasmuch as they measure behavioural change in a narrow or highly focussed way without considering any knock-on or compensating changes in behaviour elsewhere in the system. Furthermore, where there is evidence of some behavioural changes, there is little evidence of changes in health outcomes per se.

4 Behavioural Economics and Health Economics

Public intervention in health care markets results from a variety of sources of 'market failure' (e.g. problems of information, market structure, externalities and public goods resulting in resources being allocated in ways that are socially suboptimal). Public intervention, though, does not always solve these resource allocation problems: sometimes public intervention simply replaces sources of market failure with 'government failure'. The non-market mechanisms that are introduced by public intervention may also result in a distribution of resources and goods and services that is also suboptimal and, in some instances, worse than the (market) alternative.

Most publicly-funded health care programmes adopt explicit objectives aimed at prioritizing greater needs for care in allocating health care resources. This incorporates aspects of efficiency (resources allocated to the most productive uses) and both horizontal equity (i.e. equal use for equal need) and vertical equity (greater use for greater need), however the latter concepts are operationalised. Despite this central role of needs for care forming the focus of health system objectives, the methods used for planning health care resources remain largely needs-free. Expenditures, workforces and services are planned in relation to population size (expenditure per capita, doctor-population ratios and services per 1000 population) and demographic characteristics (adjusting ratios for changes in age distributions). So, as population size increases and the demographic mix shifts towards older age groups, health care resources expand, irrespective of needs. As a result, improvements in population health are not fed back into planning models as reductions in need per capita. So, while BE has been and continues to be used to change the social determinants of health (or the probabilities of sickness or diseases occurring

⁶ They reported data on proportions of respondents from different employer types that suggest their sample was representative of the Centre for Global Development's subscriber base.

and the severity of conditions), this does not affect the escalating costs of care or the sustainability of publicly funded health care systems, which remain largely supply driven. Increases in population size and the elderly share of populations leads to more doctors and nurses being employed, who then provide more health care services. If BE is to be used to improve the performance and sustainability of health care systems, attention needs to be focussed on managers, planners and providers of health care.

Can the underlying problems of performance and sustainability be explained by the cognitive biases of these participants in the system that might be addressed through BE policies? Or, do these problems result not from cognitive biases in their decision making but from structural problems in the environments in which they take decisions? For example, primary care dentistry in many countries is provided by dentists working as independent small businesses whose primary objective is to protect the financial viability of the practice. Decisions about which patients to serve and what services to provide may not be consistent with the efficient and equitable allocation of health care resources, but that is unlikely to result from cognitive biases. On the other hand, a family physician's provision of a prescribed drug to a patient might be the result of the physician's rule of thumb or automatic decisions that might differ from the physician's deliberative preferences.

Philosophically, the exhortation to 'liberal paternalism' may also create ethical dilemmas in the event that better choice architecture (etc.) gives rise to 'better decisions' but worse ends. If nudges to attend mammographic screening work, they may take some women further away from their deliberative preferences. Schmidt [33] (p. 996) argued that giving women more (or more accurate) information about the risks and benefits of breast screening may raise breast cancer mortality by reducing women's propensity to screen: "... informed decision making is important. But since better-informed women are less inclined to be screened, fewer breast cancer deaths will likely be averted." For a similar argument, see Gøtzsche and Jørgensen [34]. Viscusi [35] reported that smokers tend to overestimate the risks of smoking to their health. Correcting the underlying source of bias (or internality) may conceivably result in increased rates of smoking. In such cases, does liberal paternalism still imply individual biases be addressed, thus increasing the chance of poor health or, alternatively, should disinformation be used to change behaviour in ways that reduce health risks? Clearly, the latter would be inconsistent with the "free choice" principle [9].

Lowenstein and Ubel [36] were critical of the misuse of BE initiatives in political circles. They argued that BE is leaned on by politicians wishing to avoid tough decisions suggested by conventional microeconomic theory and evidence. Thus, a probably ineffective nudge is politically

preferred to an effective (and politically unpopular) tax. They argued that BE is thereby "asked to solve problems it was never meant to address" (p. A31). The World Bank's focus on BE to address problems in the developing world has been criticised on similar grounds [17]. It seems to us that the risks identified by Lowenstein and Ubel [36] present a real danger to the formulation of efficient health care policies: often, normative recommendations drawn from conventional economic theory and evidence are costly to institute in practice. Policies drawn from the insights of BE, such as changing choice architecture, etc. may be far less costly than the conventional alternatives. These are relevant considerations, but they should be accompanied by careful consideration of the efficacy, effectiveness and cost effectiveness of the alternatives. Much of the evidence from BE is of small changes to behaviour that may or may not affect the targeted outcomes.

5 Conclusion

Health care system sustainability depends on the effective planning, management and delivery of health care services in ways that respond to the needs of populations. Effective use of BE in managing the levels, mix and severity of needs in the population contributes little to improving sustainability if supply factors continue to determine how systems respond to changes in population needs, effective services and efficient production. There may be the potential to expand the scope of BE in health to address behavioural change among health care planners, managers and providers. However, this requires confirmation that any suboptimal behaviours by these groups are the result of internalities (biases) in their decision making as opposed to the perverse incentives generated by the extant structures and incentives created by health care policy. In our view, BE is a field that may lead to important but modest changes in health care system efficiency. Policy initiatives that draw on BE may prove useful supplements to those that draw on conventional microeconomic theory and practice in the health sector, but they are unlikely ever to be effective substitutes for policies drawn from the toolkit of conventional economics.

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