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Behavioral Economics and Health: the user's journey method to design better public health policies

Florencia Lopez Boo, Nicolás Ajzenman and Giuliana Daga

Abstract

This brief outlines the challenges of noncommunicable diseases (NCDs) and the pivotal role of individual decision-making in healthcare. It highlights behavioral biases influencing decisions and proposes a user's journey methodology rooted in behavioral economics to identify biases at key decision points, including the decision to be screened, appointment setting, attendance, and habit formation. By showcasing examples and research conducted by the IDB and other institutions, this note demonstrates how behavioral interventions can sometimes overcome these biases and bolster health programs by, for example, increasing risk saliency, reducing hassles, and addressing cognitive limitations. In conclusion, the brief underscores the potential of behavioral economics to shape scalable and cost-effective health policies, ultimately improving health outcomes regionally and globally.

Keywords: behavioral economics, public health, decision-making

JEL Codes: I10, I12, I15, I18, D90

1. Background

Noncommunicable diseases (NCDs)—mainly cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes—are the region’s biggest killers. In addition, most of these premature deaths are preventable (WHO, 2013). Although supply-side factors (good quality professionals, medicines, ambulances, facilities, and general infrastructure) are relevant for health-related outcomes, they become less effective when patient take-up is low, and this is true in a variety of settings such as cancer (Tran et al., 2022), chronic respiratory diseases, diabetes, hypertension, and cardiovascular disease (WHO, 2013). These are among the most frequent causes of preventable premature deaths across the income distribution in Latin America. Even among populations that are arguably not materially impaired, reducing the prevalence of NCDs is challenging (World Bank Open Data, 2019).

When supply-side factors are not binding, interventions that aim to change individual decisions can be a promising approach. Even when good quality healthcare is available for everyone, the prevalence of cardiovascular diseases, for example, will only improve if at-risk individuals use them (Mendis et al., 2011). Rational individuals may weigh the costs of taking action (visiting doctors regularly, improving habits) against the potential benefits (better quality of life and higher life expectancy). However, in the real world, decisions are not always rational, and individuals might make decisions that are detrimental to their health status even if the potential gains are larger than the costs (Thaler & Sunstein, 2009).

Healthy living implies sequential decision-making processes in which behavioral and cognitive biases could interfere. For example, to reduce the likelihood of developing a cardiovascular condition, one should first realize to be at risk. Then, make an appointment and see the doctor on the scheduled date. Finally, follow the doctor’s advice and adopt new habits (Figure 1). However, each one of these actions is prone to be influenced by behavioral biases (Thaler & Sunstein, 2009). For instance, humans tend to be *overconfident* (Boruchowicz & Lopez Boo, 2022). Thus, if we think we are healthier than we are, even when there are plenty of good quality facilities, we will likely not use them. Moreover, even if our assessment of our own risk is accurate, certain biases can prevent us from following through with our intentions. For instance, *limited attention* and *forgetfulness* (DellaVigna, 2009) can make us miss appointments, and other biases, such as *present bias*, can reduce our resolution to improve our habits (Bisin & Hyndman, 2020).

Behaviorally informed interventions can help enhance the effectiveness of health programs by identifying and addressing biases at each one of those key decision points. Interventions for all chronic conditions are a prototypical example (i.e. controlling diabetes or hypertension requires patients to change their behavior), but health policy is full of apparently sound policies that fail because they do not consider individual decision-making problems induced by cognitive biases.

Figure 1. The users' journey methodology to improve health using behavioral economics.

Key decision points	Behavioral biases	Behavioral insights	Channels
1. Decision to be screened	<ul style="list-style-type: none"> Inaccurate risks assessments Present bias Overconfidence/optimistic bias 	<ul style="list-style-type: none"> Simplified and timely information (what, who, where) Probabilities perception Framing (benefit or risk-framed) 	<ul style="list-style-type: none"> SMS Digital tools and apps Community-based campaigns Program feature design
2. Setting an appointment & showing-up	<ul style="list-style-type: none"> Limited attention and forgetfulness Hassle factors 	<ul style="list-style-type: none"> Timely reminders Digital apps Choice architecture and default options 	
3. Getting things done and habit formation	<ul style="list-style-type: none"> Time-inconsistency Limited self-control Cognitive load 	<ul style="list-style-type: none"> Commitment devices Financial incentives/short-term rewards Temptation bundles Direct and timely communications 	
What about doctors' behavior	<ul style="list-style-type: none"> Hassle factors Inertia/ status quo Overconfidence/optimistic bias Confirmation bias 	<ul style="list-style-type: none"> Feedback Descriptive social norms Reminders 	

Source: Author's own elaboration.

2. The user's journey methodology to improve health using behavioral economics.

Accurate beliefs and risk assessment: deciding to consult.

Oftentimes, beliefs are inaccurate and risk assessments are not salient, affecting decision-making. A pressing problem in many developing countries is the prevalence of anemia among 0 to 5-year-old children, especially in rural and poorer areas (WHO, 2016). In theory, reducing the prevalence of anemia is not particularly hard. We know that treatments based on micronutrients, when correctly implemented, are highly effective (Bernal et al., 2020). Considering this, the IDB and the government of El Salvador implemented in 2014 a massive program to deliver free micronutrient doses in rural areas. Although the implementation was relatively successful (micronutrients became generally available for 85% of the eligible population), El Salvador did not experience meaningful improvements in anemia reduction. Bernal et al. (2020) show that a biased (own) caregiver *risk assessment* could explain this disappointing result. Regardless of the availability of micronutrients, caregivers were not always willing to give them to their children if they thought they were not at risk. Given that

micronutrients are recommended for everyone without testing (precisely because the prevalence is quite high) and that anemia is a silent condition, the risks were not salient for caregivers, and this could explain why treatment adherence was low.

Increasing the salience of risk is crucial in the first part of any healthcare decision-making process. When individuals have a wrong risk assessment, any cost-benefit analysis could be wrong. Conversely, if the risk is accurately evaluated, individuals will rationally decide if they are willing to call a doctor. Other behavioral drivers, such as personality traits, time preferences, and individuals' understanding of probabilities, could influence the decision to act. For example, a higher locus of control is associated with increased chances of being screened for hypertension, and impatience (i.e., unwilling to lose in the present even if there is a more significant benefit in the future) is negatively associated with micronutrient treatment adherence (as Bernal et al., 2020, 2023 show in two different settings in El Salvador). Likewise, a social media experiment in Belize shows that specific framing of the information can increase saliency. For instance, people were more likely to click on ads regarding COVID-19 side effects if probabilities were stated with words ("few people reported discomfort") as compared to numbers ("3 out of 100 reported discomforts") (Daga et al., 2024).

Behavioral economics provides different tools to increase risk salience. An example is *loss aversion*. Banks et al. (1995) designed an intervention to motivate women in the riskiest age to undertake a mammogram. Breast cancer is one of the most common causes of death for women, but if detected early, the prognosis is often very positive. Still, many women do not adhere to the national public health protocols of regularly making appointments, even if they are in the critical age range and have a family history. Banks et al. (1995) designed a campaign with two arms delivered by video. In both cases, the "content" of the message was the same, but in one case, the script was written to emphasize the potential losses of not taking the mammogram. In contrast, in the other, the script was written to emphasize the potential gains of doing it. Because losses tend to loom larger than gains, relatively more women in the "loss" group decided to get a mammogram in the following six and twelve months. Messages containing information are important, but many times, it is not necessary *to change the* content of the information that is delivered (although in some cases it is, see Bursztyn and Yang, 2022), but the way it is presented, the moment it is delivered, and, in some cases, the messenger delivering such information (Blaga et al., 2018).

Hassle factors and choice architecture: setting an appointment.

Once an individual decides to take care of her health, the next step is to act. The gap between intention and action in health care tends to be large. Seeking medical attention may involve seemingly easy tasks such as calling the health center or hospital for an appointment. In some cases, doing so is easy (even online). In some others, unfortunately, doing so involves hassles that people tend to overstate. Thus, an individual who decided to set an appointment online could desist if the system does not work for a couple of hours, even though this is a minor cost – merely a *hassle* – compared to the potential benefit.

“Small” hassle factors can have a disproportionate effect. In a recent experiment in Uruguay, Gallegos et al. (2023) showed that encouraging women to make medical appointments for a cervical cancer screening with a digital application was significantly more effective than reminding them to do it as usual at their local clinic. Given the favorable cost-benefit of cervical cancer screening, facilitating the appointment method should not be particularly relevant. However, in some contexts, hassle factors can have outsized importance.

Choice architecture and defaults could modify behaviors. A large body of research demonstrates that people’s decision-making can be disproportionately influenced by minor variations in the choice. For instance, as Johnson and Goldstein (2003) show with data from 11 European countries, opt-in countries have a nearly 60 percentage points difference in the agreement rate to become organ donors compared to opt-out countries. In Latin America, during the COVID-19 pandemic, Boruchowicz et al. (2023) show that people are more willing to install a tracker app (which was crucial for contact tracing) if it’s installed by default (opt-out), and they do not have to install it (opt-in). Another example is vaccination, where people must actively opt-out and require a doctor’s note, making fewer people unwilling to follow routine and mandatory vaccinations.

Limited attention and forgetfulness: showing up.

Even if someone has good intentions, they may not follow through with action. Even when we have decided to go, the intention-action gap could be explained by other biases, such as limited attention. This is why many interventions in behavioral economics are based on reminders through SMS (Ajzenman & Lopez Boo, 2019) This is because, even when we already have made a decision, attention is scarce, and thus a nudge at the right moment that reminds us of our intentions could be effective. In the case of health care, reminders are especially powerful. A classic example refers to the reminders to take medication every day for chronic conditions, including HIV infection, cardiovascular disease, asthma, and others, to increase treatment adherence (see Thakkar et al. 2016). Text messages are also widely used to reduce the rate of missed appointments. For instance, Altmann and Trexler (2014) designed a simple intervention to remind individuals to attend their dentist appointments, which significantly increased attendance. Similarly, but in a different context, Hallswarth et al. (2015) implemented an SMS intervention with reminders for hospital appointments in the UK and significantly reduced the no-show rates in rheumatology, ophthalmology, gastroenterology, neurology, and cardiology.¹

In Latin America, several examples of reminders worked to improve health-related behavior. For instance, an intervention by Busso et al. (2015) in Guatemala sent a list of children who needed to complete their vaccination calendars to community health workers, which let them send timely reminders. They significantly increased vaccination rates in rural areas. In a similar setting, in an experiment conducted by Busso et al. (2017) designed to improve the uptake of prenatal care in low-resource settings, community healthcare workers in rural Guatemala were

¹ These specialties were chosen because at the time they were not the subject of any other initiatives to reduce absenteeism apart from the SMS reminders.

given up-to-date lists of pregnant women, enabling them to provide timely in-person reminders to attend clinics during visits from a mobile medical team. Whereas all community health workers are expected to provide routine public health reminders, health workers in treatment communities receive concise and up-to-date information about which women to remind. This behaviorally informed intervention significantly increased prenatal checkups six months before delivery and one to two months after delivery. An SMS-based intervention in Peru sent reminders to increase attendance at prenatal checkups, which triggered a significant increase (Beuermann et al., 2020). In Uruguay, messages with benefit and risk information increased the scheduling and attendance of cervical cancer screening. In addition, messages that encourage online booking had three times the attendance and scheduling rates compared to pure control (Sánchez et al., 2021)

Planning prompts can help patients arrange their time and make it to the doctor's appointment. Sometimes, even if they want to go, they fail to do it, as random problems interfere. For instance, when the time comes, the patient realizes he had forgotten to ask her wife to pick up the child at school that day. To avoid problems related to *a lack of planning skills* (and even *present bias*), there is a helpful tool called *planning prompts*. They are simple tools that "force" the individual to plan the details of their actions. For instance, Rogers et al. (2015) randomized three prompts to induce people to vaccinate. The first one had a simple reminder to vaccinate with no additional information. The second one had a reminder plus a blank note inviting them to write down the day they would be vaccinated. The third one had a similar message, but the invitation was to write down more details, such as the specific time they planned to vaccinate. This small nudge helped individuals who wanted to take the flu vaccine to plan accordingly.

Time inconsistency and self-control: getting things done.

Following doctors' instructions and changing behavior to prevent (or better manage) a health condition implies a set of crucial decision-making junctures that could be affected by various biases. Once a patient decides, remembers, and goes to the doctor, they may be asked change habits, such as improving dietary habits, exercising regularly, maybe reducing the number of working hours, or taking some pills regularly.

***Time inconsistency and self-control* might interfere with making the right decisions and following doctors' advice.** For instance, the behavioral economics literature emphasizes the role of *present bias* (or, more generally, time inconsistency; see Fuchs 1980) for *self-control problems*, which is very much related to health behavior. For instance, individuals with present bias who decided to improve their dietary habits are likelier to fail to follow their intentions (Gul & Pesendorfer, 2004). Several insights from behavioral economics could help to build healthy habits.

Commitment devices allow individuals to voluntarily restrict their future options to avoid self-control problems. Commitment devices are tools designed based on insights from behavioral economics (Bryan et al., 2010) and could be effective for individuals who have

self-control problems and are sophisticated enough to be aware of them (DellaVigna & Malmendier, 2004). Individuals are willing to pay extra to avoid deviating from their original plan later on. For instance, individuals could set a goal (reducing weight) and commit money they will not recover unless the goal is reached. These tools are helpful in stopping undesired habits, such as smoking, overeating fat, or taking a cab instead of walking to work every day. A classic example is the Committed Action to Reduce and End Smoking (CARES) account (Giné et al., 2010), designed to help smokers quit. The authors designed a product called CARES in the Philippines with the following characteristics: smokers who declared their intentions of quitting were to deposit money in a bank account whenever they wanted. The only condition is that she will not recover the money unless she spends six months without smoking a single cigarette. Interestingly, many people decided to deposit despite the risk they will not be able to quit and thus lose the money. The authors compared the behavior of the CARES group (those who were offered the product) versus a control group and found that smokers in the CARES group were significantly more likely to stop smoking after six and twelve months.

Providing incentives could be effective at the early stages of habit formation. Besides commitment devices (which could be useless if individuals do not recognize they have self-control problems), there are many other tools informed in the literature of behavioral economics that help to build better habits. An example is an experiment by Charness and Gneezy (2009) in which they paid students to go to the gym for a week and the subsequent four weeks. Not surprisingly, individuals who were paid were more likely to go to the gym (incentives work), but what is particularly interesting is that, after payments stopped, students in the treatment work kept attending the gym much more often than students in the control group. Habits are hard to build, but once they are built, sometimes they are hard to stop.

Another way of building good habits is by implementing “temptation bundles” (Milkman et al., 2014). The idea is simple: to offer a product that combines a tempting part (watching a comedy film) and a “duty” part (going to the gym). In their experiment, they offered a bundle of a chick flick-type audio-book novel that could only be used in the gym. This way, individuals would be able to do something they enjoy, which could be seen as a guilty pleasure, but they feel it is justified because they are doing something they *need* to do. The consumption bundle had a substantial effect on the probability of building the habit of going to the gym.

Finally, direct communications informed by behavioral concepts, which can be delivered through SMS or WhatsApp messages, can also be helpful to change behavior and eventually build new habits. In a field experiment in Brazil in 2020 (Boruchowicz et al., 2020), the government sent different types of messages to citizens in order to make them aware of the risks of not complying with COVID-related preventive policies. For instance, in one of the study arms, they emphasized *civic duty* (taking care of your family and friends is your duty). In contrast, in other arms, they emphasized *social norms* (most people are wearing masks) or *risks* (even without knowing you could be putting other people at risk). The results showed significant improvement in self-reported measures of preventive behavior.

Social norms and incentives: The role of doctors.

Every stakeholder in the healthcare process could be prone to those mistakes. So far, the focus has been on patients' decision-making process and the critical junctures, which could be prone to make wrong decisions affected by cognitive biases. However, doctors can make mistakes, too. In most interactions, there are important information asymmetries between doctors and patients, and doctors' biases could be particularly damaging because patients rely on them as expert advisers. An example of this is the problem of overprescription of antibiotics when the medication is not medically indicated, which has led to resistant bacteria (Shallcross & Davies, 2014).

Social norms can affect doctors' prescription decisions. A plausible hypothesis to explain overuse is that doctors rely on social norms: they think everyone is doing it, so why should they not? In a famous experiment in the UK, Hallsworth et al. (2016) presented the results of an intervention showing medical doctors that their antibiotic prescription was above the norm (what other doctors were doing). This simple *nudge* triggered a significant reduction in over-prescriptions. In a similar study in Argentina, Torrente et al. (2020) implemented an online intervention (by email) in which doctors received a communication showing that they were prescribing too much nimodipine (a highly prescribed drug for the treatment of cognitive impairment and dementia in Argentina with little evidence to support its use). As in Hallsworth et al. (2016) paper, the effect was clear: treated doctors significantly reduced the prescriptions of nimodipine.

Non-monetary incentives can help improve doctors' productivity. Besides *social norms*, several behavioral economics insights could help improve the behavior of healthcare workers, such as doctors, nurses, or community health workers. For instance, in a field experiment in El Salvador, Bernal and Martinez (2020) found that non-monetary incentives substantially impacted several indicators related to productivity.

3. Way forward

Behavioral economics has proved to be an invaluable tool for improving the effectiveness of health policies in a scalable and cost-effective way. By increasing our understanding of how healthcare actors think, make decisions, and behave, we can improve the design of policies to get better outcomes. Behavioral economics is a relatively "young" field, as only 40 years have passed since the seminar paper posing a theory to explain decision-making (Kahneman & Tversky, 1979). However, from this moment on, the academic and policy implementors community has accumulated evidence regarding which behavioral *insights* (changes in policy design and features) work in different contexts for different public policy problems. This brief is intended to highlight the potential application of these concepts to health policy. It is based on existing literature and research conducted by the Interamerican Development Bank and other institutions, and it is not meant to be exhaustive but rather to provide evidence and ideas to support policy design and implementation to improve health outcomes.

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Appendix 1. Behavioral biases

- **Cognitive overload:** The cognitive load is the amount of mental effort and memory used at a given moment in time. Overload is when the volume of information provided exceeds an individual's capacity to process it. Once patients are sick, the cognitive burden could be too high for individuals.

- **Confirmation bias:** The tendency to search for and interpret information in a way that confirms or supports one's prior beliefs or ideas.
- **Hassle factors/Procrastination:** We frequently do not act on our intentions because of small factors or inconveniences that hinder us or make it uncomfortable to act. These factors could include how the information is presented, its length or that additional actions must be taken to execute a decision.
- **Inaccurate risk assessment/Lack of information:** People may lack relevant information, for instance, because information is difficult to obtain, scarce, or hard to understand. Patients may feel mistrust about the sources of information.
- **Limited self-control:** the inability to restrain one's impulses or habitual responses to avoid undesirable behaviors.
- **Loss aversion:** Refers to the idea that a loss causes distress that is greater than the happiness caused by a gain of the same size, when two options that involve risk and uncertainty are relatively compared.
- **Mistrust:** Patients underestimate or mistrust the quality of care an app could provide and the app's ability to manage any queries during a virtual medical appointment. To reduce mistrust, the e-mails sent to the treatment groups also highlight that the service is provided by the same doctors whom patients see during their in-person visits.
- **Optimism bias:** Optimism bias makes us underestimate the probability of negative events and overestimate the probability of positive events. Optimism bias could lead people to underestimate the probability of getting sick, making it less likely that they will download the app and register for telemedicine options.
- **Overconfidence:** the tendency to overestimate or exaggerate our own capacity to perform a certain task.
- **Present bias:** The tendency to opt for a lesser benefit in the short term over a greater benefit in the longer term, which is associated with a preference for instant gratification.
- **Social norms:** The unwritten rules governing behavior within a society. A distinction is drawn between "descriptive norms," which describe the way in which individuals tend to behave (for example, "most people arrive on time"), and "prescriptive norms," which establish what is considered acceptable or desired behavior, independent of how individuals behave ("Please arrive on time").
- **Status Quo bias:** Our tendency to maintain the status of things. This current status, or status quo, is used as a reference point, and any change with regard to this point is seen as a loss.

Appendix 2. IDB Publications on the use of behavioral economics to improve health

- [*Increasing the Use of Telemedicine*](#)
- [*Combating COVID-19 vaccine hesitancy: Behaviorally informed campaigns in the Caribbean*](#)
- [*Increasing the Take-up of Public Health Services: An Experiment on Nudges and Digital Tools in Uruguay*](#)
- [*Default Options: A Powerful Behavioral Tool to Increase COVID-19 Contact Tracing App Acceptance in Latin America?*](#)
- [*Effect of a Social Norm Feedback Program on the Unnecessary Prescription of Nimodipine*](#)
- [*Let's \(Not\) Get Together! The Role of Social Norms in Social Distancing during COVID-19*](#)
- [*Information and Communication Technologies, Prenatal Care Services, and Neonatal Health*](#)
- [*Can reminders boost vaccination rates?*](#)
- [*Improving access to preventive maternal health care using reminders: Experimental evidence from Guatemala*](#)
- [*Increasing the use of diagnostic and contact tracing apps*](#)
- [*Changing COVID-19 Vaccination Attitudes in Mexico with an Online Behavioral Intervention*](#)
- [*Promoting compliance with COVID-19 preventive measures using behaviorally informed SMSs in Sao Paulo*](#)
- [*Better than my neighbor? Testing for overconfidence in COVID-19 preventive behaviors in Latin America*](#)