Behavioral Economics Insights for Encouraging COVID-19 Vaccination

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When it comes to the COVID-19 pandemic, achieving herd immunity as quickly as possible has become increasingly urgent as new COVID-19 variants (e.g. the Brazilian, U.K., South African) are on the rise, some of which are considered to be more contagious, more dangerous, or both.

Achieving such herd immunity, though, has turned out to be quite challenging. In addition to the insufficient availability of vaccines, which has hampered especially the early efforts in the US and is still a major problem across the globe, the main difficulty going forward will be the reluctance of a substantial subset of the population to voluntarily get vaccinated. A survey by Monmouth University shows that 24% of US respondents are "unwilling to get vaccinated" and another 19% are waiting to "see how it goes" . To achieve herd immunity it is estimated that a immunization rate of 75-90% is required based on a vaccine efficacy rate of 80% (Anderson et al., 2020).

Reasons to not get vaccinated are manyfold, ranging from religious objections, particular political affiliation, to a lack of trust in the efficacy of vaccines, doubts about the long-term effects, and even a perception of an outright danger of getting vaccinated. While most of these worries have been shown to be unwarranted it has been challenging to convince those people opposed to getting vaccinated of that.

Worse, some individuals go even further and prevent others from getting a vaccine by blocking access to the vaccination sites (Kornfield, 2021). The threat of similar behavior is likely to increase in the future as more large-scale vaccination sites are opening up across the US and in other countries .

The anti-vaccination movement is not new, but the vaccination decisions used to be more private as the shots (such as against flu; tetanus, diphtheria & pertussis; measles, mumps & rubella) have been mostly given behind closed doors in doctors' offices and hospitals. The creation of large vaccination sites makes the vaccination decision a more public one - one can be photographed/video-recorded while staying in line at the site. This may pose additional challenges for those who are on the fence about vaccinating and makes targeting of the vaccination sites by anti-vax protesters more likely.

The traditional approaches to public policy such as educating people on the benefits of certain behavior or providing a legislative framework will not be enough to reach the vaccination numbers needed for herd immunity. Given the scepticism about vaccination and the suspicious speed of emergency vaccine authorizations, especially in the US, and the distrust of not only politicians, but also scientists and big corporations, in particular the pharmaceutical industry, casts doubts that providing more, even if targeted, information will be very effective. Similarly, considering the

resistance to more government involvement in the US, a legislative approach requiring vaccinations will be seen as intrusive and garner significant resistance, possibly even backfiring into lower vaccination rates. As such, applying insights from behavioral science, including nudges, are better suited to increase the uptake rates.

This paper' focus is on exploring such insights and their potential to improve the trajectory of vaccinations, so that herd immunity becomes an achievable objective. We analyze the psychological biases relevant to the vaccination decisions as well as discuss behavioral science tools that can be used by policy makers to increase the vaccine intake rates. We consider behavioral interventions on three levels: individual, local (communities and states), and national (country).

The initial/default vaccination choice of the individual is influenced by several psychological biases, including status quo/default bias, loss and regret aversion; present bias, self-serving fairness bias or naive realism, non-linear probability weighting, peanut effect, narrow bracketing, projection bias and hot-cold empathy gap, overoptimism, self-control, framing and anchoring effects. We will consider each in detail and explore how far they are relevant for explaining the reluctance of a subset of the population to get vaccinated. Identifying these biases is an important step in developing behavioral interventions that will either harness them or will try to hamper them.

This allows us then to analyze what behavioral interventions can be used to affect or change the default decision of people. We structure these interventions on three levels. The first, individual level includes interventions that are customized for a particular person on the individual level, such as messages from personally known and trusted people (e.g. one's doctor, friends, family, community and religious leader). The second, local level involves interventions by local agencies (e.g. county and state departments of health, community-level non profit organizations, religious organizations, hospital systems, public schools, colleges and universities, major employers in the area) that are framing the local public health messaging and can directly work in the communities to create or affect norms and expectations regarding vaccinations. The third, national level includes entities/agencies (e.g. the president, the CDC, doctors, celebrities/opinion leaders, major news organizations) that are framing the country-level public policy and whose messages have a broader reach.

We conclude with a set of recommendations that can be used by policy makers, leaders and "norm entrepreneurs" (Sunstein, 2019) as well as ordinary individuals in convincing those who hesitate to vaccinate.

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