

# VACCINE HESITANCY

## Understanding Belief Formation

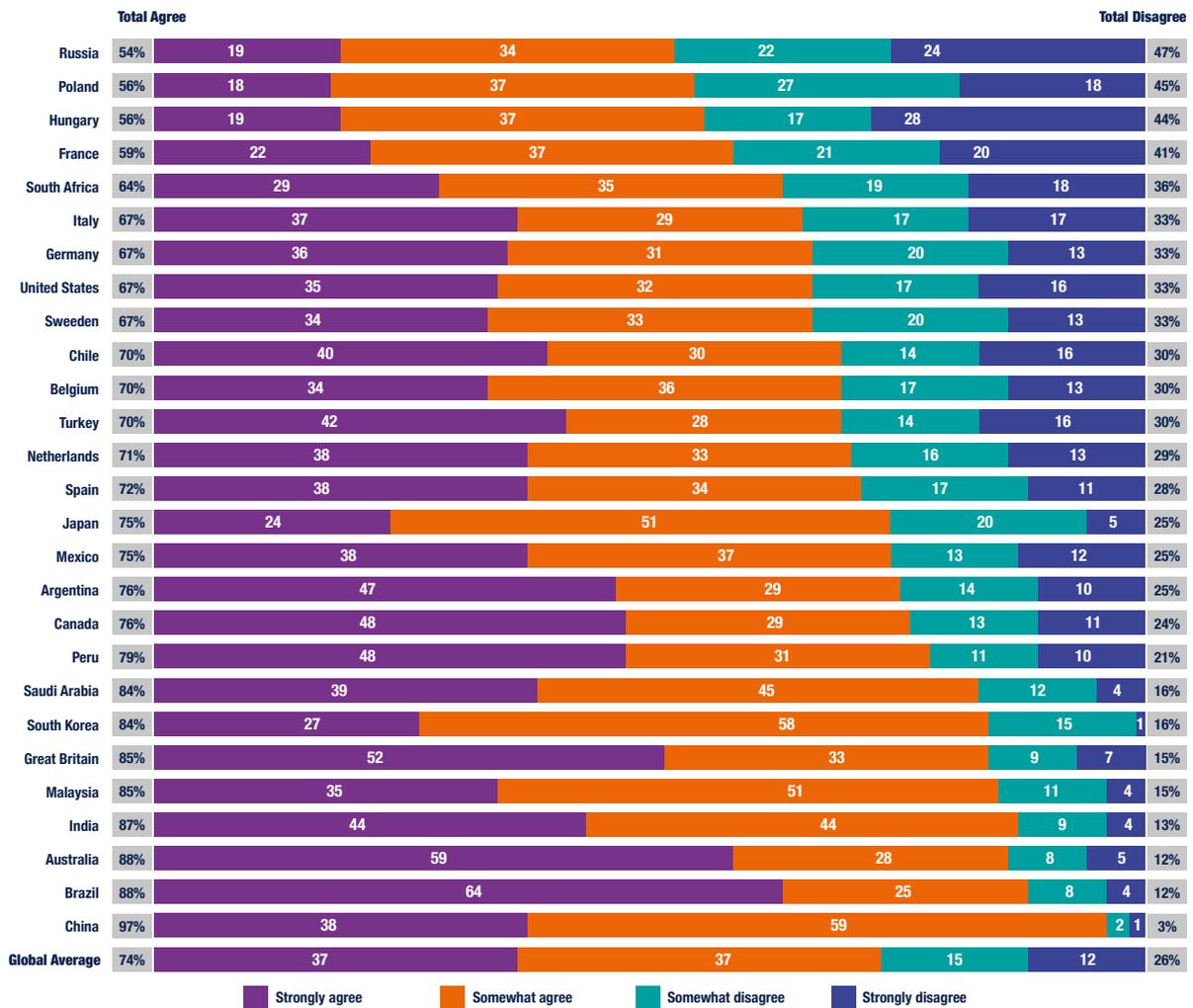
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### INTRODUCTION

Vaccine hesitancy, the 'reluctance or refusal to vaccinate despite the availability of vaccines', was listed among the World Health Organisation's top ten threats to health in 2019.<sup>1</sup> In our increasingly geographically connected world, rejection of inoculation has potentially devastating and far-reaching effects – and what was previously seen as an isolated threat from the more vocal anti-vaccination groups was already being recognised as one of our greatest global concerns.

Now in 2020, COVID-19 has put the topic of vaccination centre-stage, with the expedited development of a COVID-19 vaccine widely viewed as the only real solution to the current pandemic. Indeed, in a global Ipsos poll on this topic in August 2020, around one in four (26%) adults globally disagreed that they would take a vaccine for COVID-19 if it were available, with worry about side effects, followed by perception of effectiveness being mentioned most frequently as reasons for not getting a vaccine.<sup>2</sup>

**Figure 1** If a vaccine for COVID-19 were available, I would get it



Source: Ipsos Global Advisor, July 24 - August 7, 2020. Base: 19,519 online adults aged 16-74 across 27 countries

While it is difficult to know at this stage how attitudes towards vaccines will change over time, 78% of physicians responding to our G-MED’s Global Physician Forum poll anticipate higher rates of general vaccination as a result of COVID-19.<sup>3</sup> Of course, it is possible that any safety or efficacy concerns around a COVID-19 vaccine post launch would also colour perceptions of vaccines overall. Only time will tell.

However, with heightened coverage on the progress of COVID-19 vaccines, one question we can usefully consider now is how

individuals’ vaccination beliefs and behaviours are formed and maintained in the first place – and where the opportunities lie to intervene in the interests of public health. In our view, the discussion to date has been overly focused on the individual, and often underestimates the role of cultural and political situations and other social drivers. We believe that to deal with the issue of vaccine hesitancy we need to develop interventions that take social belief formation and maintenance into account. Furthermore, by viewing vaccine decision making as something that happens within social belief formation, it provides a framing that can be applied globally to help to unpack regional nuances.

## HOW DO PEOPLE FORM BELIEFS ABOUT VACCINATION RISK?

### Models of Decision Making

Vaccination behaviour is often considered to be a question of individual beliefs and perceptions, typically assuming that people are rational creatures who make optimal decisions and probabilistic judgments about their chances of being affected by a particular risk.

In reality, most of us have busy lives and limited time to seek out information even when it's available. So, we take mental shortcuts which save time but can result in cognitive errors.<sup>4</sup> Examples of such errors include over-confidence about our ability to judge risks and omission bias whereby we prefer not to act even when doing so is beneficial to us.<sup>5</sup>

In the context of vaccines, this means that people give disproportionate weight to the harms of receiving vaccinations and dismiss the dangers of not receiving them.

Despite the focus on how these mental shortcuts can lead to suboptimal decisions, this does not tell the full story. Specifically, some shortcuts like attitudes around vaccination safety are often closely tied to actual vaccination behaviour. Research shows that having been previously vaccinated is strongly linked to subsequent uptake of vaccines, both for the individual and their children, and for the same and other vaccines.<sup>6</sup> The optimum scenario is to turn vaccination into routinised behaviour that requires less deliberate planning, while simultaneously lowering perceptions of risk through continued experience of vaccination without adverse effects.<sup>7</sup> A recommended vaccine schedule is one intervention that could initiate this positive feedback loop.

### All informational claims are not treated equally

Although encouraging vaccine uptake is possible among those who do not have strong views against them, others will require convincing via informational claims about the benefits. However, all informational claims are not treated equally. When people see a claim, they typically assess its truth value by asking themselves one or more of the following questions.<sup>8</sup>

- **Do others in my environment believe this claim?** Checking for social consensus can sometimes mean referring to public knowledge by polls, but fundamentally people are influenced by how often they themselves have heard the claim. Familiarity gives the impression that a view is widely held.
- **Is there a lot of evidence for the claim?** Some will take a speedier route to a judgment, based on how easy it is to recall pieces of evidence from their own memory – which means simple and memorable claims will trump more complex views of reality. In today's society, social media content could be very easily brought to mind when making vaccine decisions.
- **Does this claim match what I already believe?** When something is not consistent with what we already think we stumble, whereas new knowledge that fits with our current thinking is easy to agree with (also known as confirmation bias<sup>9</sup>). It would therefore be easier to enhance a latent worry about vaccines than to challenge underlying concerns.
- **Does the claim tell a good story?** When details are presented in a coherent story-based format, people are more likely to believe them. A coherent story about a child being negatively impacted by a vaccine is easily told, but it is more difficult to construct a story about the harms avoided by vaccination.
- **Does the claim come from a credible source?** A source can be perceived as credible based on its expertise, past behaviour or perceived motive – or, at its simplest, how a person feels about the source (affect heuristic<sup>10</sup>). This may mean that views from a close friend are difficult to overcome even if they diverge from the views of a healthcare professional who has expertise but lacks the interpersonal credibility.

In other words, risk perceptions do not form in a social vacuum. Not only do people prefer to socialise with others who share their opinions, they often prefer to consume media that confirms their own beliefs.<sup>11</sup>

It is important to remember here that even if an individual rejects vaccination, it doesn't mean that health is not a key concern for them – just that they happen to have a different understanding of the nature of risk and what is an acceptable threshold.<sup>12</sup> This is especially relevant for parents who are responsible for managing their child's risk exposure.

They may be more likely to exercise caution given that deciding for someone else engages different psychological processes around risk. Vaccination may not feel like the safe option here because people are more likely to assess a threat based on the characteristics of a hazard or danger (reinforced by the evocative imagery of anti-vaccination campaigns) than an objective risk like developing a disease. Furthermore, social amplification can turn an adverse event, like a negative reaction to a vaccine, into a wider social disturbance.<sup>13</sup>

## HOW ARE RISK BELIEFS CREATED AND MAINTAINED IN A SOCIETY?

### A socially embedded perspective

Vaccination is a fundamentally social activity because it affects the health of others as well as ourselves. Therefore, we need a socially embedded perspective of risk, such as the social representation theory (SRT) as advocated by Helene Joffe, to help us understand why and how particular risk beliefs evolve and are maintained socially – and why addressing vaccine hesitancy requires interventions that take social belief formation and maintenance into account.<sup>14</sup>

From the SRT perspective, our judgments of risk are not simply a product of our mental processes – rather, they are guided by our social, cultural and political worldviews.<sup>15</sup> The worldview that we apply to danger and risk is shaped both by others in our social sphere (e.g., friends, family, community) and the broader sociocultural, historical and institutional forces present in a society. Over time, shared perceptions become internalised in the individual's perceptions and become rationalisations for new events.

One important aspect of risk perception through the SRT approach is that these representations are guided by emotional responses to the hazard, which are shaped by motivations to protect one's in-group and self-identity.<sup>16</sup>

When a hazard is seen to put the collective identity of the group in danger, this creates a tension or anxiety that requires defending against the feeling of being threatened. People may draw on symbolic ways of thinking (images or metaphors) that result in the threat being conceptually split from the group identity. This can be seen in how vaccines are linked to other symbolic representations, from other medical treatments like injectables to microchips. As such, different groups will assign different representations to the hazard, depending on how much it necessitates being symbolically split from the identity that requires protection.<sup>17</sup> In other words, people will view vaccines through the lens of their group attachments and the experiences of their in-group, which transforms the abstract notion of vaccines into 'reality' in the minds of those who are thinking about them.

### The influence of social interactions

We also need to consider the influence of social interactions. The most basic level of interaction happens in a one-to-one format in social dyads such as a patient and healthcare provider or parent and child, which can be influenced by past experiences or power dynamics.

Another level of interaction is a one-to-many format, i.e. mass media. Next, social media has brought an increased focus on the many-to-many format, which entails many messengers broadcasting their message to many recipients. Mass and social media play an important role because they are often an individual's first point of contact with a potential danger – and, as we know, the media often chooses not simply to report expert knowledge of risk but to simplify and sensationalise it by setting up debates about responsibility and blame to attract attention.<sup>18</sup>

From here, we see the emergence of an additional level of social influence via social networks – a web of relations and interactions between people. As people like to self-select who they want to spend time with, those who vaccinate might associate more with other vaccinators<sup>19</sup> which can create a clustering of vaccination attitudes where individuals start imitating the behaviour of others.<sup>20</sup> This can turn into social contagion, where influences such as emergent social

norms pass through various social networks and, in the case of vaccination, result in low vaccination coverage in a community when individuals start to imitate successful free riders.<sup>21</sup>

Some have theorised that when vaccination rejecters or refusers connect on social media it potentially polarises their

opinions even further.<sup>22</sup> However, even though a growing body of literature exists on the influence of social networks and preferences on health behaviour, more research is needed to understand how these platforms influence vaccine beliefs and behaviours.<sup>23</sup>

## CONCLUSIONS

To date, much of the psychological research on vaccination behaviour and risk perception has been focused on the individual. However, humans are social animals and vaccination behaviour is a fundamentally social activity. If we want to deal effectively with the issue of vaccine hesitancy, we need to develop holistic interventions that also reflect social beliefs about vaccines and vaccination.

To reflect social belief formation, this means being sensitive to how beliefs are:

1. formed based on experiences and by looking to others that share views
2. evolve and are maintained socially.

By considering these influences, it will help to build a full picture of how people's social

ecosystem, accounting for their social, cultural and political worldviews - including how mass media has contributed to the creation of shared representations - shape vaccine beliefs.

This also helps us to consider how self-identities, social interactions at every level, and the increasing risk of social contagion through social media play a role in augmenting and amplifying beliefs.

In short, understanding belief formation from both individual and social perspectives will allow us to develop effective and socially sensitive solutions to address the rise of antivaccination attitudes around the world. COVID-19 has had a devastating impact worldwide, with many lives lost. If nothing else, it may at least offer us a window of opportunity for rebuilding understanding of and belief in the value of vaccination.



## REFERENCES

1. World Health Organisation. 2020. Ten threats to global health in 2019. [ONLINE] Available at: <https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019>. [Accessed 12 August 2020].
2. Source: Ipsos Global Advisor (Ipsos conducted online interviews among a total of 19,519 adults aged 18-74 in United States, Canada, Malaysia, South Africa, and Turkey, and 16-74 in 22 other countries between July 24 and August 7, 2020. Q: To what extent do you agree or disagree with the statement: 'If a vaccine for COVID-19 were available, I would get it') © Ipsos 2020, all rights reserved.
3. Source: G-MED's Global Physician Forum including Physicians opting into G-Med Physicians Only Community replying to this poll (n=629) between May 18 – July 3 2020. Q: Do you anticipate a change in vaccination rates post COVID-19? © Ipsos 2020, all rights reserved. (online at: <https://www.ipsos.com/sites/default/files/ct/publication/documents/2020-07/understanding-physician-needs-during-covid-19-july-8-ipsos.pdf>)
4. Tversky, A. and Kahneman, D., 1974. Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), pp.1124-1131. (Online at: <http://www.uvm.edu/pdodds/files/papers/others/1974/tversky1974a.pdf>)
5. Ritov, I. and Baron, J., 1990. Reluctance to vaccinate: Omission bias and ambiguity. *Journal of Behavioral Decision Making* (Online Abstract: <https://onlinelibrary.wiley.com/doi/abs/10.1002/bdm.3960030404>)
6. Schmid, P., Rauber, D., Betsch, C., Lidolt, G. and Denker, M.L., 2017. Barriers of influenza vaccination intention and behavior—a systematic review of influenza vaccine hesitancy, 2005–2016. *PloS one*, 12(1). (Online at: <https://journals.plos.org/plosone/article/file?type=printable&id=10.1371/journal.pone.0170550>, p11)
7. Brewer, N.T., Chapman, G.B., Rothman, A.J., Leask, J. and Kempe, A., 2017. Increasing vaccination: putting psychological science into action. *Psychological Science in the Public Interest*, 18(3), pp.149-207. (Online at: <https://journals.sagepub.com/doi/pdf/10.1177/1529100618760521>)
8. Schwarz, N., Newman, E. and Leach, W., 2016. Making the truth stick & the myths fade: Lessons from cognitive psychology. *Behavioral Science & Policy*, 2(1), pp.85-95. (Online at: <https://behavioralpolicy.org/articles/making-the-truth-stick-the-myths-fade-lessons-from-cognitive-psychology/>)
9. Klayman, J., 1995. Varieties of confirmation bias. *Psychology of learning and motivation*, 32, pp.385-418.(Online Abstract at: [https://doi.org/10.1016/S0079-7421\(08\)60315-1](https://doi.org/10.1016/S0079-7421(08)60315-1))
10. Finucane, M.L., Alhakami, A., Slovic, P. and Johnson, S.M., 2000. The affect heuristic in judgments of risks and benefits. *Journal of behavioral decision making*, 13(1), pp.1-17. (Online at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.589.6788&rep=rep1&type=pdf>)
11. Joffe, H., 2003. Risk: From perception to social representation. *British journal of social psychology*, 42(1), pp.55-73 (Online at: [https://www.researchgate.net/publication/10788122\\_Risk\\_From\\_perception\\_to\\_social\\_representation](https://www.researchgate.net/publication/10788122_Risk_From_perception_to_social_representation))

12. Slovic, P., & Weber, E. U. 2002. Perception of risk posed by extreme events. Paper presented at the Risk Management Strategies in an Uncertain World Conference, Palisades, NY, April 12–13. (Online at: <https://eclass.gunet.gr/modules/document/file.php/SOCGU270/6.%20%CE%93%CE%B5%CF%89%CF%80%CE%BF%CE%BB%CE%B9%CF%84%CE%B9%CE%BA%CF%8C%20%CF%81%CE%AF%CF%83%CE%BA%CE%BF/perception%20of%20risk.pdf>)
13. (Slovic & Weber, 2002)
14. (Joffe, 2003)
15. Slovic, P. 1997. Trust, emotion, sex, politics and science: Surveying the risk-assessment battlefield. In M. Bazerman, D. Messick, A. Tenbrunsel, & K. Wade-Benzoni (Eds.), *Environment, ethics and behaviour* (pp. 277–313). San Francisco: New Lexington Press. (Online Abstract at: <https://link.springer.com/article/10.1023/A:1007041821623>)
16. (Joffe, 2003)
17. (Joffe, 2003)
18. Brown, J., Chapman, S. and Lupton, D., 1996. Infinitesimal risk as public health crisis: news media coverage of a doctor-patient HIV contact tracing investigation. *Social science & medicine*, 43(12), pp.1685-1695. (Online Abstract at: [https://doi.org/10.1016/0277-9536\(95\)00402-5](https://doi.org/10.1016/0277-9536(95)00402-5)); Herzlich, C. and Pierret, J., 1989. The construction of a social phenomenon: AIDS in the French press. *Social Science & Medicine*, 29(11), pp.1235-1242. (Online Abstract at: [https://doi.org/10.1016/0277-9536\(89\)90062-2](https://doi.org/10.1016/0277-9536(89)90062-2))
19. Onnela, J.P., Landon, B.E., Kahn, A.L., Ahmed, D., Verma, H., O'Malley, A.J., Bahl, S., Sutter, R.W. and Christakis, N.A., 2016. Polio vaccine hesitancy in the networks and neighborhoods of Malegaon, India. *Social science & medicine*, 153, pp.99-106. (Online at: <http://humannaturelab.net/images/publications/166-Polio-vaccine-hesitancy-in-the-networks-and-neighborhoods-of-Malegaon-India.pdf>)
20. Bandura, A. 1971. *Social Learning Theory*. General Learning Press, New York. (Online at: [http://www.asecib.ase.ro/mps/Bandura\\_SocialLearningTheory.pdf](http://www.asecib.ase.ro/mps/Bandura_SocialLearningTheory.pdf)); Beard, F.H., Hull, B.P., Leask, J., Dey, A. and McIntyre, P.B., 2016. Trends and patterns in vaccination objection, Australia, 2002–2013. *Medical Journal of Australia*, 204(7), pp.275-275. (Online abstract at: <https://doi.org/10.5694/mja15.01226>)
21. (Onnela et al., 2016)
22. Christakis, N.A. and Fowler, J.H., 2013. Social contagion theory: examining dynamic social networks and human behavior. *Statistics in medicine*, 32(4), pp.556-577. doi:10.1002/sim.5408 (Online at: [http://fowler.ucsd.edu/social\\_contagion\\_theory.pdf](http://fowler.ucsd.edu/social_contagion_theory.pdf))
23. Meyer, S.B., Violette, R., Aggarwal, R., Simeoni, M., MacDougall, H. and Waite, N., 2019. Vaccine hesitancy and Web 2.0: exploring how attitudes and beliefs about influenza vaccination are exchanged in online threaded user comments. *Vaccine*, 37(13), pp.1769-1774. (Online Abstract at: <https://www.sciencedirect.com/science/article/pii/S0264410X19302233>)