

Defining and measuring vaccine hesitancy

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When the term ‘vaccine hesitancy’ first appeared, it was deemed ambiguous and difficult to measure. A systematic review of published articles on vaccine hesitancy suggests it should be defined as a state of indecisiveness regarding a vaccination decision, independently of behaviour, and that it needs new modes of analysis and measurement.

Vaccine hesitancy has become a household term in the wake of the COVID-19 pandemic, with more people in the world thinking about vaccines than perhaps at any time in our history. The term ‘hesitancy’ was already gaining traction in vaccine discussions in the decade before COVID-19 erupted, and had become a growing topic of research and public health concern: the World Health Organization (WHO) had already named vaccine hesitancy as one of the top ten global health threats in 2019.

But what does vaccine hesitancy really mean? And how useful is it in terms of actionable measures to address it? In a recent article in *Nature Human Behaviour* – an extensive review of over 400 articles – Bussink-Voorend and colleagues¹ investigate how the concept of vaccine hesitancy is characterized and measured. They find that vaccine hesitancy is operationalized in a number of ways, and conclude that it is therefore not a practicable concept.

This comprehensive review and analysis updates the field beyond a previous 2014 systematic review², and is not the first to question the usefulness and specificity of the term vaccine hesitancy – a liminal state of uncertainty in making a vaccination decision. Early references cited in the paper challenged various characterizations of vaccine hesitancy as being an unspecific and ambiguous notion³ in need of a clear definition⁴. Bussink-Voorend et al. make a strong case for distinguishing between hesitancy and behaviour, and argue that including behaviour within a definition of vaccine hesitancy is not tenable. This disputes the 2014 WHO Sage Working group definition of vaccine hesitancy as a behavioural phenomenon; however, it is also a point made in Maya Goldenberg’s recent book *Vaccine Hesitancy*⁵, which similarly rejects the definition of vaccine hesitancy as a behaviour. In their conclusion, Bussink-Voorend et al. propose that vaccine hesitancy should be defined as “a state of indecisiveness regarding a vaccination decision.”

For a concrete example of the distinction between vaccine hesitancy as a psychological state and a behaviour, we can look to the recent example of the French health pass⁶. A survey of a representative sample of French adults asked respondents how they felt after getting a COVID-19 vaccine: “Were you relieved? Did you feel regret? Or were you angry?” Between March and September 2021, they discovered a striking increase in the proportion of people feeling regret or anger after COVID-19 vaccination. Even more telling was the finding that the number of people who had doubts about the vaccine – despite being vaccinated – increased from 44% to 61% after the government



introduced the health pass. This suggests that many vaccinated people remained in a psychological state of indecisiveness. Thus, the health pass encouraged vaccination but did not reduce hesitancy, confirming the importance of distinguishing between vaccine hesitancy and behaviour.

This is also in agreement with a recent narrative review of vaccine hesitancy, which discusses the many different influencing factors along the path of decision-making towards accepting, delaying or refusing a vaccine⁷. Vaccine hesitancy is not a static state; instead, vaccine decision-making is a journey with ups and downs, and changes over time with different influences and nudges along the path that sometimes prompt hesitancy and sometimes nudge a positive intention to vaccinate. In the case of COVID-19 vaccines, the constantly evolving information environment – including new information (and misinformation), changing guidance and requirements, and a volatile and changing epidemic context that affected risk perceptions and the felt need (or not) for vaccination – were all factors that have prompted changing sentiments around the vaccines, sometimes prompting eagerness and at other times hesitancy, delays or outright refusal of vaccination.

The dynamic nature of vaccine hesitancy is not discussed in Bussink-Voorend et al.’s review. Nonetheless, in their conclusions the authors argue that vaccine hesitancy is “a psychological state of being undecided,” and psychological states are dynamic by nature. This changing, even volatile, and emotive nature of vaccine hesitancy also requires new disciplines of analysis beyond the public health, social science and biomedical studies reviewed in the paper. ‘Big data’ analyses, such as those from computer science and engineering, are crucial when it comes to analysing and measuring the dynamic and viral nature of hesitancy⁸.

Overall, as discussed in Bussink-Voorend’s review and in related literature, the distinction between the affective nature of vaccine hesitancy in the context of decision-making, and it being a behaviour, is crucial. Vaccine hesitancy is not a behaviour.

Where does this leave us in terms of research and measurement of vaccine hesitancy? Maybe we are asking the wrong questions and need

to look at the new realities of contested science, challenged governments and publics armed with their own notions of evidence.

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