



Vaccine hesitancy at both ends of the socioeconomic spectrum: a new paradigm for understanding the role of systemic inequity

Dylan Vlasak, Rachel E. Dinero[^], Nicole A. Roitman

Department of Psychological and Brain Sciences, Colgate University, Hamilton, NY, USA

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Correspondence to: Rachel E. Dinero, PhD. Department of Psychological and Brain Sciences, Colgate University, 13 Oak Dr., Hamilton, NY 13346, USA. Email: rdinero@colgate.edu.

Abstract: Despite the established safety and effectiveness of the coronavirus disease 2019 (COVID-19) vaccine, vaccine hesitancy has contributed to preventable COVID-19-related deaths. In this paper we focus on how systemic inequity plays a contributing role in vaccine hesitancy. A bulk of research suggests that COVID-19 vaccine hesitancy is a problem in marginalized communities. This literature may seem inconsistent with research on other vaccine preventable diseases, which identifies the prevalence of vaccine refusal in wealthy populations within wealthy countries. As such, we discuss existing research on the factors motivating vaccine hesitancy at both ends of the socioeconomic spectrum. We propose a novel model for understanding the differential pathways to vaccine hesitancy from systemic inequity. Specifically, we identify the impact of systemic disadvantages (e.g., poverty, race, lack of access to quality healthcare) on feelings of fear and mistrust of public health authorities, which, in turn, lead to increased vaccine hesitancy. Alternatively, systemic advantages (e.g., wealth, high quality healthcare) can lead to decreased perceptions of disease risk and heightened feelings of superiority to public health authorities, attitudes that also result in increased vaccine hesitancy. Further we identify strategies for combating vaccine hesitancy among both advantaged and disadvantaged populations and highlight significant gaps in the literature and directions for future research.

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Introduction

The coronavirus disease 2019 (COVID-19) vaccine is estimated to have prevented approximately 20 million deaths globally within one year of its release (1). Despite the established safety and effectiveness of the COVID-19 vaccine, under-vaccination has caused a multitude of preventable deaths. It is estimated that over half a million deaths in the United States alone could have been prevented with vaccination (2,3). While vaccine availability certainly

contributes to these numbers, worldwide survey data from 2021 indicated that 40–50% of respondents were unwilling to receive available COVID-19 vaccines, with wide variation across and within countries (4). Vaccine hesitancy includes vaccine refusal but can also involve delaying vaccination, vaccinating on an alternative schedule to that which is recommended, or vaccinating as recommended but with concerns or uncertainty (5,6). Vaccine hesitancy is a complex problem fueled by multiple sources, including

[^] ORCID: 0000-0003-4254-7402.

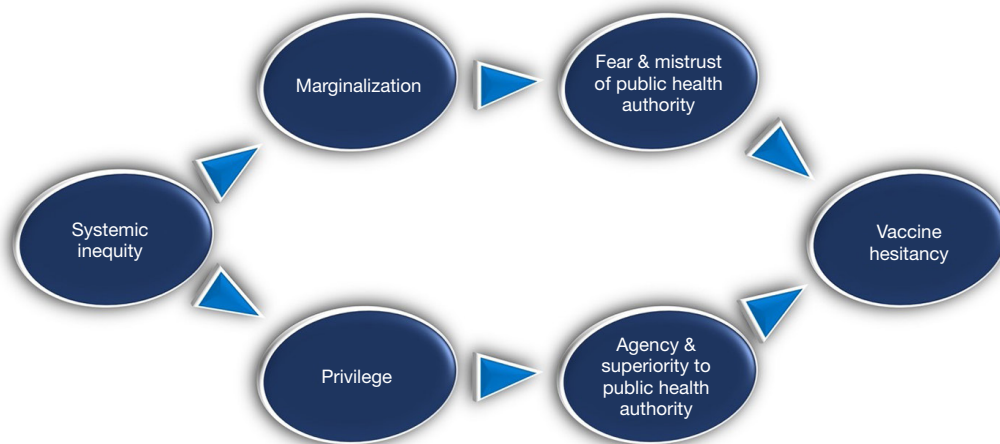


Figure 1 Inequity leads to vaccine hesitancy across both ends of the socioeconomic spectrum.

a recent focus on the influence on political orientation (7) and misinformation spread through social media (8). In this paper we focus on the role of systemic inequity on vaccine hesitancy in predominantly White, economically stratified countries, specifically as it pertains to racial/ethnic identity and economic status. While the bulk of research suggests that COVID-19 vaccine hesitancy is primarily a problem in historically marginalized communities, we present research that privilege [i.e., structural advantages resulting from membership in dominant groups (9)] is a strong predictor of vaccine hesitancy and must be considered to fully understand the impact of inequity on vaccine uptake. Further, we overview population-specific strategies for reducing vaccine hesitancy, identify gaps in the existing literature, and provide a new model for understanding vaccine hesitancy across the socioeconomic spectrum.

Framework for understanding the impact of systemic inequity on vaccine hesitancy

We propose a novel framework for understanding how systemic inequity contributes to vaccine hesitancy (Figure 1). This framework rests on the inevitable disparity between those who are historically marginalized by and those who benefit from the structural advantages resulting from system inequity. Below, we outline research linking marginalization to a learned fear and mistrust of public health authority, resulting from a history of abuse and neglect. Further we show how this fear and mistrust impact vaccine hesitancy among those who have been marginalized. Additionally, we address the impact of privilege (i.e., systemic advantages) on

feelings of agency and superiority to public health authority, which in turn contributes to vaccine hesitancy. While there is markedly less research on the latter process, we outline the supporting research and call for future research to address this pathway more directly.

Marginalization and vaccine hesitancy

The disparity in vaccine hesitancy between historically marginalized racial/ethnic populations and White populations in predominantly White countries is well documented. When the COVID-19 vaccine was first made available in the United States, Black individuals were more likely to express hesitancy regarding the COVID-19 vaccine (10). Outside of the United States, other predominantly White nations report similar findings. In the United Kingdom, while total sample vaccine hesitancy was 18%, 71.8% of Black participants and 42.3% of Pakistani/Bangladeshi participants reported hesitancy (11). Compounding the impact of racial/ethnic marginalization on vaccine hesitancy is the oft concurrent influence of economic marginalization. A multitude of sources have identified higher levels of COVID-19 vaccine hesitancy among low-income populations living within wealthy nations with high levels of economic disparity. A meta-analysis of data from approximately 60,000 participants from 13 countries revealed that lower-income individuals in the UK, France, Ireland, and Australia were less likely to express willingness to vaccinate in 8 of the 9 studies examined (4). A cross-sectional study of 1,189 randomly selected residents of Vaud, Switzerland reported similar data,

finding that lower income individuals were less likely than wealthier individuals to vaccinate against COVID-19 (12). A similar association was found in the United States, with lower income predicting decreased trust in healthcare officials and higher levels of vaccine hesitancy (13).

Fear and mistrust of public health authority

These findings are consistent with the theory that mistrust of medical professionals is a learned, protective trait among historically marginalized individuals resulting from a history of abuse and mistreatment (14). Across the global community, COVID-19 has disproportionately impacted members of historically marginalized communities (15,16). Members of these communities experience higher levels of physical and mental health conditions due in part to economic and social factors, namely poverty and health inequity, that increase stress and limit access to health resources (17). The same inequities that contribute to higher levels of infection, morbidity, and mortality also impact trust in healthcare systems as well as public health authorities and government officials. This, in turn, impacts attitudes toward vaccinations. Members of marginalized communities have historically shown mistrust in vaccines due to experiences of healthcare inequities (18), unethical medical experimentation (19), and underrepresentation in vaccine trials (20). For example, in the United States, Black individuals were the most likely of any racial group to report COVID-19 vaccine hesitancy, citing the country's history of racism in medical care and research as a primary reason (21). Similarly, First Nations people in Canada made up over 70% of active COVID-19 cases (despite making up about 10% of the population), and still expressed significant vaccine hesitancy, citing concern about being expendable test subjects for vaccine testing (19). These fears are not unfounded, given that despite being at the greatest risk from COVID-19, ethnic minority groups were significantly underrepresented in COVID-19 vaccine trials (20). As such, the same factors that increase risk of infection, morbidity, and mortality from COVID-19 also contribute to vaccine hesitancy in marginalized individuals. In this way, vaccine hesitancy among historically marginalized individuals makes sense. Mistrust of medical professionals is a learned, protective trait among historically marginalized individuals resulting from a history of abuse and mistreatment (14).

Take together, these findings underscore the importance of understanding the learned fear that motivates vaccine hesitancy in historically marginalized populations. These

motivations explain the efficacy of vaccine messaging that emerges from within a marginalized community, particularly from trusted community leaders (22). For example, initially low vaccination rates among American Indian and Alaskan Natives increased when specific efforts were made to frame the importance of vaccination within the cultural framework of community health and protection of native culture and peoples (23). This further illustrates the importance of cultural context on vaccine messaging, as COVID-19 messaging that reduced hesitancy in one country often did not have the same impact in other countries (24). Therefore, collaborating with trusted members of historically marginalized communities to direct vaccine messaging from within the community can be a viable means of increased vaccination. Not only is the input of in-group members critical for developing culturally appropriate messaging, but trusted leaders are also far more likely to impact their community members than outsiders.

Privilege and vaccine hesitancy

While COVID-19 vaccine hesitancy may be more prevalent within historically marginalized populations, it nonetheless remains a significant problem among White and wealthy individuals in wealthy countries. For one, vaccine hesitancy in any population impacts the effectiveness of vaccines (25). Vaccine effectiveness hinges on what happens at the population-level. Vaccination thresholds, which can be upwards of 95%, must be reached to achieve herd immunity, and eliminate an infectious disease. Additionally, local rates of vaccination are even more important than state or county-wide rates, which can mask unvaccinated pockets of the population. These small pockets can provide a foothold for an infectious disease, that can lead to widespread outbreaks (26).

Further, if COVID-19 vaccine uptake mirrors that of previous vaccines, we can expect to see increased refusal in these more privileged populations. Research based on data from 2016 in Australia found that postal codes associated with higher-income populations had lower compliance with Australia's National Immunisation Program Schedule for childhood vaccines (27). Data from 2010 and 2018 across 86 low- and middle-income countries (28) found that 10 countries showed higher childhood vaccine coverage among poor individuals than wealthy individuals in 2018. Further, none of these countries showed lower vaccine rates among the wealthy in 2010. A study from Brazil identified similar trends, assessing four birth cohorts in 1982, 1993,

2004, and 2015 for childhood vaccination coverage in relation to paternal/maternal income and education. While high vaccination coverage was prevalent in children of the uppermost socioeconomic level in 1982, this statistic was reversed by 2015, making high-income children the least vaccinated socioeconomic group (29). There is already early evidence that the COVID-19 vaccine uptake will follow a similar trend. Longitudinal data from January to October 2021 revealed that while Black American populations had greater initial COVID-19 vaccine refusal and hesitancy, both declined rapidly. On the other hand, vaccine refusal among White American populations remained constant (22). This difference may be a result of more targeted efforts to reduce hesitancy in Black populations (22), or because the factors contributing to White hesitancy are more inherently stable. Unfortunately, there is significantly less research understanding factors that contribute to COVID-19 hesitancy among privileged populations.

Agency and superiority to public health authority

With COVID-19 vaccine hesitancy already beginning to follow the trend of other vaccine-preventable diseases, it is critical to understand the motivations for vaccine hesitancy among White and wealthy populations. Despite the importance of understanding this hesitancy, there is surprisingly little research quantifying these motivations. Pre-COVID-19 interviews with a high-income vaccine hesitant sample in Perth, Australia found that vaccine hesitancy was based on an inflated sense of agency in making medical decisions without doctors or public health officials, and a preference for “natural” methods of healthcare (30). Additionally, participants reported low perceived risk of infection or disease, contrasted with a high perceived risk of vaccination. A similar study in the United States reported on interviews from 25 White mothers in a wealthy community who refused vaccination for their children (31). These participants reported high levels of perceived personal efficacy in making health decisions for their children and higher confidence in preventing illness through individual “natural” measures such as eating organic food and exercising. Additionally, these participants report lower perceived risk of infection or disease, which is contrasted with their high perceived risk of vaccination. Essentially, the privilege of healthcare and other resource access serves as a safety net for these parents, bolstering their feelings of both safety and efficacy (31).

Vaccine hesitancy among those with privilege may

be more than just a product of resource access. There is evidence that individuals with high socioeconomic status perceive themselves to be more capable, hardworking, important, and deserving of resources and privileges than others (32,33). These beliefs could foster a tendency to discount vaccine messaging from public health experts. Additionally, recognition of one’s own intellectual fallibility predicts more pro-vaccine attitudes (34). Thus, it seems likely that socioeconomic advantages contribute to an inflated sense of agency, which increases the likelihood of discounting public health experts, therefore increasing overall vaccine hesitancy.

While research on reducing vaccine hesitancy among White and wealthy individuals is sparse, one pre-COVID-19 study found success in messaging that framed vaccines in terms of the “natural” processes that are valued by White and wealthy individuals in wealthy countries. Higher income parents in Australia were more likely to respond positively toward vaccinating their children when practitioners emphasized that vaccines help children’s immune systems strengthen naturally and framed side effects as indicators of “self-strengthening and body renewal” (35). Another proposed pathway to reducing vaccine hesitancy among White and wealthy individuals is the imposition of legal restrictions places on unvaccinated people (24). While controversial, this same method was the primary factor that resulted in increased seatbelt usage after targeting messaging was largely ineffective (36). Given the controversial and systemic nature of changing legislation, it makes more sense in the short-term to focus on strategies that have been demonstrated to be effective with vaccine hesitancy, while simultaneously building research on the motivations behind vaccine hesitancy in White and wealthy populations.

Directions for future research

Despite a bulk of evidence that there is vaccine hesitancy on both ends of the socioeconomic spectrum, there is a noted dearth of literature on the psychological and systemic factors that contribute to vaccine hesitancy among White and wealthy individuals in wealthy countries. Previous research has focused almost exclusively on the impact of marginalization on vaccine hesitancy, with extensive research demonstrating the impact of marginalization and mechanisms through which it contributes to vaccine hesitancy. The research linking privilege to vaccine hesitancy, however, is much less extensive and focused

primarily on population-level data. As such, there is little focus on the mechanisms through which privilege leads to vaccine hesitancy, and the broader framework of inequity is ignored. A comprehensive understanding of vaccine hesitancy requires that we address this issue with individual-level data at both ends of the socioeconomic spectrum, simultaneously assessing marginalization, fear and mistrust of public health authorities, privilege, perceived agency and superiority to public health authorities, and vaccine hesitancy (Figure 1). Demonstrating the holistic impact of inequity on vaccine hesitancy reframes the problem in an important way, emphasizing that vaccine hesitancy is not just a problem in poor minority communities or in wealthy White communities, rather, it is a byproduct of an inequitable system.

We close this paper by reiterating that vaccine hesitancy is a complex and multifaceted problem. While not the only antecedent of vaccine hesitancy, systemic inequity contributes to hesitancy at both ends of the socioeconomic spectrum. Our goal here is to present potential socioeconomically specific strategies for reducing vaccine hesitancy and to provide a framework to guide future research that can support vaccine advocacy. Systemic inequity is a barrier to a better functioning society for a multitude of reasons. The more we can demonstrate the impact of systemic inequity on vaccine hesitancy, the better position we will be in to advocate for change.

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appropriately investigated and resolved.

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References

1. Watson OJ, Barnsley G, Toor J, et al. Global impact of the first year of COVID-19 vaccination: a mathematical modelling study. *Lancet Infect Dis* 2022;22:1293-302.
2. Jia KM, Hanage WP, Lipsitch M, et al. Estimated preventable COVID-19-associated deaths due to non-vaccination in the United States. *Eur J Epidemiol* 2023;38:1125-8.
3. Zhong M, Kshirsagar M, Johnston R, et al. Estimating vaccine-preventable COVID-19 deaths under counterfactual vaccination scenarios in the United States. *medRxiv* 2022. doi: 10.1101/2022.05.19.22275310.
4. Robinson E, Jones A, Lesser I, et al. International estimates of intended uptake and refusal of COVID-19 vaccines: A rapid systematic review and meta-analysis of large nationally representative samples. *Vaccine* 2021;39:2024-34.
5. Benin AL, Wisler-Scher DJ, Colson E, et al. Qualitative analysis of mothers' decision-making about vaccines for infants: the importance of trust. *Pediatrics* 2006;117:1532-41.
6. MacDonald NE; SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: Definition, scope and determinants. *Vaccine* 2015;33:4161-4.
7. Hornsey MJ, Finlayson M, Chatwood G, et al. Donald Trump and vaccination: The effect of political identity, conspiracist ideation and presidential tweets on vaccine hesitancy. *J Exp Soc Psychol* 2020;88:103947.
8. Neely SR, Eldredge C, Ersing R, et al. Vaccine Hesitancy and Exposure to Misinformation: a Survey Analysis. *J Gen Intern Med* 2022;37:179-87.
9. Bailey A. Privilege: Expanding on Marilyn Frye's "Oppression". *J Soc Philos* 1998;29:104-19.
10. Guidry JPD, Laestadius LI, Vraga EK, et al. Willingness

- to get the COVID-19 vaccine with and without emergency use authorization. *Am J Infect Control* 2021;49:137-42.
11. Roberts HA, Clark DA, Kalina C, et al. To vax or not to vax: Predictors of anti-vax attitudes and COVID-19 vaccine hesitancy prior to widespread vaccine availability. *PLoS One* 2022;17:e0264019.
 12. Veys-Takeuchi C, Gonseth Nusslé S, Estoppey S, et al. Determinants of COVID-19 Vaccine Hesitancy During the Pandemic: A Cross-Sectional Survey in the Canton of Vaud, Switzerland. *Int J Public Health* 2022;67:1604987.
 13. Holroyd TA, Limaye RJ, Gerber JE, et al. Development of a Scale to Measure Trust in Public Health Authorities: Prevalence of Trust and Association with Vaccination. *J Health Commun* 2021;26:272-80.
 14. Ojikutu BO, Bogart LM, Dong L. Mistrust, Empowerment, and Structural Change: Lessons We Should Be Learning From COVID-19. *Am J Public Health* 2022;112:401-4.
 15. Heslin KC, Hall JE. Sexual Orientation Disparities in Risk Factors for Adverse COVID-19-Related Outcomes, by Race/Ethnicity - Behavioral Risk Factor Surveillance System, United States, 2017-2019. *MMWR Morb Mortal Wkly Rep* 2021;70:149-54.
 16. Page KR, Genovese E, Franchi M, et al. COVID-19 vaccine hesitancy among undocumented migrants during the early phase of the vaccination campaign: a multicentric cross-sectional study. *BMJ Open* 2022;12:e056591.
 17. Ahnquist J, Wamala SP, Lindstrom M. Social determinants of health--a question of social or economic capital? Interaction effects of socioeconomic factors on health outcomes. *Soc Sci Med* 2012;74:930-9.
 18. Laurencin CT. Addressing Justified Vaccine Hesitancy in the Black Community. *J Racial Ethn Health Disparities* 2021;8:543-6.
 19. Mosby I, Swidrovich J. Medical experimentation and the roots of COVID-19 vaccine hesitancy among Indigenous Peoples in Canada. *CMAJ* 2021;193:E381-3.
 20. D'Souza RS, Wolfe I. COVID-19 vaccines in high-risk ethnic groups. *Lancet* 2021;397:1348.
 21. Malik AA, McFadden SM, Elharake J, et al. Determinants of COVID-19 vaccine acceptance in the US. *EClinicalMedicine* 2020;26:100495.
 22. Morales DX, Paat YF. Hesitancy or Resistance? Differential Changes in COVID-19 Vaccination Intention Between Black and White Americans. *J Racial Ethn Health Disparities* 2022. [Epub ahead of print]. doi: 10.1007/s40615-022-01494-1.
 23. Haroz EE, Kemp CG, O'Keefe VM, et al. Nurturing Innovation at the Roots: The Success of COVID-19 Vaccination in American Indian and Alaska Native Communities. *Am J Public Health* 2022;112:383-7.
 24. Steinert JI, Sternberg H, Prince H, et al. COVID-19 vaccine hesitancy in eight European countries: Prevalence, determinants, and heterogeneity. *Sci Adv* 2022;8:eabm9825.
 25. Smith TC. Vaccine Rejection and Hesitancy: A Review and Call to Action. *Open Forum Infect Dis* 2017;4:ofx146.
 26. Masters NB, Eisenberg MC, Delamater PL, et al. Fine-scale spatial clustering of measles nonvaccination that increases outbreak potential is obscured by aggregated reporting data. *Proc Natl Acad Sci U S A* 2020;117:28506-14.
 27. Bryden GM, Browne M, Rockloff M, et al. The privilege paradox: Geographic areas with highest socio-economic advantage have the lowest rates of vaccination. *Vaccine* 2019;37:4525-32.
 28. Cata-Preta B, Santos TM, Barros AJD, et al. Measles vaccine coverage: The rise of vaccine hesitancy in upper-middle income countries. *Int J Epidemiol* 2021. doi: 10.1093/ije/dyab168.114.
 29. Silveira MF, Buffarini R, Bertoldi AD, et al. The emergence of vaccine hesitancy among upper-class Brazilians: Results from four birth cohorts, 1982-2015. *Vaccine* 2020;38:482-8.
 30. Swaney SE, Burns S. Exploring reasons for vaccine-hesitancy among higher-SES parents in Perth, Western Australia. *Health Promot J Austr* 2019;30:143-52.
 31. Reich JA. Neoliberal mothering and vaccine refusal: Imagined gated communities and the privilege of choice. *Gend Soc* 2014;28:679-704.
 32. Côté S, Stellar JE, Willer R, et al. The Psychology of Entrenched Privilege: High Socioeconomic Status Individuals From Affluent Backgrounds Are Uniquely High in Entitlement. *Pers Soc Psychol Bull* 2021;47:70-88.
 33. Grubbs JB, Exline JJ. Trait entitlement: A cognitive-personality source of vulnerability to psychological distress. *Psychol Bull* 2016;142:1204-26.
 34. Huynh HP, Senger AR. A little shot of humility: Intellectual humility predicts vaccination attitudes and intention to vaccinate against COVID-19. *J Appl Soc Psychol* 2021;51:449-60.
 35. Ward PR, Attwell K, Meyer SB, et al. Understanding the

perceived logic of care by vaccine-hesitant and vaccine-refusing parents: A qualitative study in Australia. *PLoS One* 2017;12:e0185955.

36. Carpenter CS, Stehr M. The effects of mandatory

seatbelt laws on seatbelt use, motor vehicle fatalities, and crash-related injuries among youths. *J Health Econ* 2008;27:642-62.

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