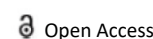RESEARCH ARTICLE

# Role of Meritocratic and Diversity Beliefs in Gen Z's Trust and COVID-19 Vaccine Hesitancy: A Mixed-Method Study

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**ABSTRACT**

The purpose of this study is to understand the ways in which unvaccinated Generation Z (Gen Z)'s trust in COVID-19 information sources is associated with their vaccination intentions in conjunction with their beliefs in meritocracy and diversity. Study 1 conducted an online survey by recruiting 526 unvaccinated Gen Zers residing in Grand Forks County, North Dakota. Study 2 performed a series of focus groups and in-depth interviews with 26 unvaccinated Gen Zers in Grand Forks County, North Dakota. Study 1 found that stronger meritocratic beliefs had significantly lower odds of vaccination intention (95% Confidence Interval [CI] 0.264, 0.725), whereas stronger diversity beliefs had significantly higher odds of vaccination intention (95% CI 1.114, 2.553). From the stratified samples, trust in one's own doctor was more significantly associated with vaccination intentions for those with high meritocratic beliefs (95% CI 1.247, 4.101). Conversely, trust in state health organizations was more significantly associated with vaccination intentions for those with high diversity beliefs (95% CI 1.059, 4.238). Study 2 found two themes: (1) strong trust in doctors and experts, while wavering confidence in government sources and media and (2) persuading without convincing related to vaccination. Understanding one of the Gen Z's core beliefs – beliefs in meritocracy and diversity – can contribute to this generation's high level of vaccine hesitancy and strong distrust in COVID-19 information sources. Public health professionals should continue to invest in health and science communication, which directly connecting scientists and infectious disease experts with unvaccinated young adults.

## Introduction

Generation Z (hereafter, Gen Z) is referred to as the generation of individuals born after 1996. Gen Z is characterized by its emphasis on transparency and diversity, its background (e.g., high education levels), and an increasing reliance on the government to solve problems. Gen Z is also known for its heavy use of social media and digital news consumption [1-8]. Gen Z's communities also tend to be mediated communities that exist on social media, whereas previous generations appear to view communities as geographically local communities [9-12].

In the COVID-19 context, Gen Z has been identified as the most significant barrier among the adult populations to reaching herd immunity, as this group shows highest vaccine hesitancy [6, 7], with a higher rate than anticipated in the early phase of vaccine rollout [13-21]. Gen Z has also expressed its strong distrust in COVID-19 vaccines and relevant information sources [22-30]. Gen Z's COVID-19 vaccine hesitancy has put college towns at risk especially in highly vaccine-hesitant states [31-39], as a majority of their community members consist of young adults. The

Grand Forks County in North Dakota (ND) is not an exception [40-48]. While approximately a quarter of the county's population (66,861) is Gen Zers [40-42], only 46% of them completed the primary series and 10% of them received a bivalent booster dose as of February 2023 (North Dakota Department of Health and Human Services, 2023). This generation may have high immunity to COVID-19, but they could also be carriers of the virus. This could be especially harmful if members of Gen Z spread the virus, specifically to vulnerable populations. However, research shows that Gen Z could be especially influential in triggering the adoption process of vaccination [19].

Having a better understanding of Gen Z's core beliefs is an important first step to address this generation's vaccine hesitancy, as these beliefs tend to determine individuals' trust in various information sources and behaviors [11]. Research that identifies attributes that could influence Gen Z in the adoption of the COVID-19 vaccine could contribute to effective promotional campaigns. While research related to Gen Z and their adoption of COVID-19 vaccines is burgeoning [5], much more is needed. The current study

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contributes specific health communication strategies to persuade young people to be vaccinated.

This study particularly focuses on meritocratic and diversity beliefs [49,50], as Gen Z's core beliefs. They refer to the extent to which people believe meritocratic elements (e.g., good education, ambition, and hard work) or diversity elements (e.g., an individual's race, gender, race, or family background) are important for success [31]. These beliefs could drive Gen Z's attitudes and behaviors. In fact, individuals' beliefs in meritocracy and diversity have been a dominant part of American ideology [24] in that success and social mobility are believed to the outcomes of individuals' hard work and skills [17, 26-32]. Gen Z was raised by previous generations with strong meritocratic beliefs and was heavily influenced by the rapid growth of diversity beliefs, all while navigating the pandemic in their late teen and early 20s, which has a lasting impact on many aspects of their lives [33,34].

The theory of planned behavior is often used to predict health behaviors [3] and has shown to be useful in health communication campaign design [4,39,44]. Since behavioral beliefs and their evaluations influence attitudes toward a behavior and, ultimately, behavioral intentions [28,38], it is important for health communicators to understand the target population's behavioral beliefs so as to generate desirable behavioral outcomes. Focusing on unvaccinated Gen Z in Grand Forks County, ND, first, this research examined the roles of meritocratic and diversity beliefs in the relationship between Gen Z's trust in information sources and their vaccination intention (Study 1). This research also elaborated on the ways in which Gen Zers form trust in sources and its influences on their vaccination decisions (Study 2). Given the novelty of applying meritocratic and diversity beliefs to the COVID-19 context among Gen Z using a mixed-methods approach, this research adds to the literatures regarding vaccine hesitancy among Gen Z and offers much-needed guidance on public health interventions targeted to hesitant or "fence-sitting" Gen Zers [51].

## Materials and Methods

### Methods of study-1

**Sample:** According a priori G*Power analysis [10], 411 was the minimum sample size to achieve 80% power with a medium effect size at the α =0.05 level for logistic regression analyses, after adjusting for covariates.

A total of 370 participants were initially recruited based on initial eligibility criteria: those who were born between 1996 and 2004, had never been vaccinated against COVID-19, and resided in Grand Forks County, ND. Potential participants were initially excluded if they were born before 1996 or after 2004; they had at least one dose of a COVID-19 vaccine; and they lived outside of Grand Forks County, ND.

Since the initial sample did not reach the desired sample size based on the power analysis, the age eligibility criterion was expanded to include additional participants who were born between 1993 and 1995. This resulted in the sample size of 564, which was considered appropriate to test the research questions.

**Procedure:** Individuals who clicked on a survey link embedded in a promotional Facebook post or a banner ad used in this study were first asked to read the consent form. They were then asked to answer eligibility questions. Those who met eligibility criteria were able to proceed to answer remaining questions. The IRB approval was obtained from the authors' institution, which considered this research "expedited."

**Measurements:** Intention to receive COVID-19 vaccines was measured by the following question: "How likely would you get a COVID-19 vaccine in the next month?" The response options ranged from 1 ("extremely unlikely") to 5 ("extremely likely") [35]. This question was later recoded into a dichotomous variable as 0 ("extremely unlikely," "somewhat unlikely," and "unsure") or 1 ("somewhat likely" and "extremely likely").

Trust in sources was assessed by indicating the extent to which individuals trust each source for accurate information about COVID-19 vaccine. Eight sources were provided: (1) friends, (2) family, (3) scientists and medical and infectious disease experts, (4) my doctor, (5) local health organizations, (6) state health organizations, (7) national health organizations, and (8) news articles. The response options ranged from 1 ("strongly distrust") to 5 ("strongly trust").

Meritocratic and diversity beliefs were measured by asking participants to indicate whether they considered each element to be important for getting ahead in life [31]. Ten elements were provided with three meritocratic elements (e.g., hard work) and seven diversity elements (e.g., a person's race). The responses options ranged from 1 ("not at all important") to 5 ("essential"). Meritocratic beliefs were constructed by averaging the first three scales (Cronbach's α =0.70); and diversity beliefs were constructed by averaging the remaining seven scales (Cronbach's α =0.70) based on acceptable reliability statistics. These two index variables were recoded into a dichotomous variable based on its median value of 3.33 and 3.43, respectively.

Demographics and socioeconomic status variables, namely, race, household income, religion, occupation, gender, ethnicity, age, and political ideology, were measured [45].

**Statistical analysis:** First, descriptive analyses were obtained. Logistic regression models then estimated Odds Ratios (OR) and 95% Confidence Intervals (CI) for the association between independent variables and vaccination intention. Models included participants' demographic and socioeconomic factors. Next, eight source variables were included in the model. Fully adjusted models included the index variables of meritocratic and diversity beliefs. To test effect modifications by the median-split variables of meritocratic beliefs or diversity beliefs, interaction terms for each

source trust*meritocratic beliefs and each source trust*diversity beliefs were included in models. If the p-value for an interaction term was <0.05, we interpreted it as a significant interaction term. For any statistically significant interaction terms were observed, models were stratified by high and low meritocratic and diversity beliefs. All analyses were completed with SPSS version 28.

## Methods of study-2

**Sample:** We recruited a total of 26 participants for focus group and in-depth interviews using the same inclusion and exclusion criteria used in Study 1. Additional exclusion criterion in Study 2 was the participation in Study 1. We conducted either a focus group session or an in-depth interview via Zoom depending on participants' preference and schedule. We provided all participants with a $30 gift card after the completion of the interview.

**Procedure:** After the participants entered a Zoom session, we asked for verbal informed consent. Once all participants finish introducing themselves, researchers started asking questions about their opinions and attitudes toward COVID-19 and vaccines. We used the constant comparison process to analyze transcribed qualitative data into themes and to identify the characteristics of each individual theme. The IRB approval was obtained from the authors' institution, which considered it "expedited."

## Results and Discussion

### Results of study-1

Among 564 potential participants, 22 of them had received at least one dose of COVID-19 vaccination, becoming ineligible. Additional 14 refused to answer the vaccination history question, becoming ineligible to proceed. Finally, two participants did not have residential addresses in the Grand Forks County. Taken together, the final sample included 526 participants.

### Participants' characteristics

Participants' age ranged from 18 to 29 (M=25.04, SD=2.08). The sample consists of 337 males (68.5%) and 155 females (31.5%). Most of them were White (n=360, 73.2%). About half of participants make less than $50,000 (n=255, 48.5%) and identified as Christians (n=247, 47.0%). Over 80% of participants (n=389) identified themselves as politically liberal. Table 1 presents the characteristics of participants.

**Table 1.** Characteristics of participants

|  | N | % |
|---|---|---|
| **Sex** |  |  |
| Female | 155 | 31.5 |
| Male | 337 | 68.5 |
| **Ethnicity** |  |  |
| Hispanic | 130 | 26.4 |
| Non-Hispanic | 363 | 73.6 |
| **Race** |  |  |
| White | 360 | 73.2 |
| Non-White | 132 | 26.8 |
| **Household income** |  | 2 |
| <$50,000 | 255 | 51.8 |
| ≥ $50,000 | 237 | 48.2 |
| **Religion** |  |  |
| Christian | 247 | 50.2 |
| Non-Christian | 245 | 49.8 |
| **Job** |  |  |
| Clerical/Office/Sales | 225 | 46.2 |
| Others | 262 | 53.8 |
| **Political ideology** |  |  |
| Extremely liberal | 96 | 19.8 |
| Moderately liberal | 204 | 42.1 |
| Slightly liberal | 89 | 18.4 |
| Neither liberal nor conservative | 50 | 10.3 |
| Slightly conservative | 27 | 5.6 |
| Moderately conservative | 19 | 3.9 |
| Extremely conservative | 0 | 0 |

### The relationship between trust in sources and vaccination intention

An increase in the trust in scientists, medical and infectious disease experts was associated with significantly higher odds of vaccination intention (OR=1.769, 95% CI 1.289, 2.402) (Model 3), (Table 2). Stronger meritocratic beliefs had significantly lower odds of vaccination intention (OR=0.438, 95% CI 0.264, 0.725), whereas stronger diversity beliefs had significantly higher odds of vaccination intention (OR=1.528, 95% CI 1.114, 2.553) (Model 3) (Table 2).

### The moderating role of meritocratic and diversity beliefs

In models stratified by high and low meritocratic beliefs (Table 3), trust in scientists and medical and infectious disease experts was associated with higher odds of vaccination intention for those with high meritocratic beliefs (OR=1.924, 95% CI 1.051, 3.522) than for those with low meritocratic beliefs (OR=1.694, 95% CI 1.125, 2.552) (interaction p<0.001), yet the confidence intervals for both groups appeared to overlap. In addition, trust in one's doctor showed significantly higher odds of vaccination intention for those with high meritocratic beliefs (OR=2.261, 95% CI 1.247, 4.101) than for those with low meritocratic beliefs (OR=0.923, 95% CI 0.607, 1.403) (interaction p<0.001) (Table 3).

In models stratified by high and low diversity beliefs (Table 3), trust in scientists and medical and infectious disease experts showed higher odds of vaccination intention for those with high diversity beliefs (OR=2.884, 95% CI 1.428, 5.823) than for those with low diversity beliefs (OR=1.484, 95% CI 1.025, 2.149) (interaction p<0.001). However, the confidence intervals for both groups seemed to overlap. Moreover, trust in state health organizations was associated with

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significantly higher odds of vaccination intention for those with high diversity beliefs (OR=2.118, 95% CI 1.059, 4.238) than for those with low diversity beliefs (OR=1.020, 95% CI 0.702, 1.482) (interaction p<0.05).

**Table 2.** Logistic regression analysis predicting the relationship between trust in sources and vaccination intention.

| | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI | OR | 95% CI |
| White | 0.27 | (0.146, 0.501) | 0.317 | (0.167, 0.601) | 0.359 | (0.187, 0.687) |
| ≥ 50,000 | 0.621 | (0.382, 1.008) | 0.669 | (0.392, 1.141) | 0.684 | (0.397, 1.176) |
| Christian | 0.298 | (0.182, 0.490) | 0.355 | (0.207, 0.610) | 0.403 | (0.234, 0.694) |
| Clerical | 1.097 | (0.682, 1.762) | 1.097 | (0.660, 1.825) | 1.331 | (0.785, 2.256) |
| Female | 0.651 | (0.395, 1.073) | 0.669 | (0.392, 1.141) | 0.667 | (0.387, 1.150) |
| Non-Hispanic | 0.678 | (0.366, 1.256) | 0.52 | (0.269, 1.002) | 0.478 | (0.246, 0.930) |
| Age | 0.889 | (0.798, 0.991) | 0.864 | (0.769, 0.971) | 0.846 | (0.752, 0.953) |
| Political ideology | 1.004 | (0.845, 1.194) | 1.102 | (0.912, 1.331) | 1.049 | (0.859, 1.281) |
| Friends | | | 0.997 | (0.733, 1.356) | 1.088 | (0.795, 1.488) |
| Family | | | 0.931 | (0.707, 1.226) | 1.014 | (0.761, 1.352) |
| Scientists and experts | | | 1.769 | (1.298, 2.411) | 1.76 | (1.289, 2.402) |
| My doctor | | | 1.296 | (0.952, 1.764) | 1.355 | (0.989, 1.856) |
| Local health organizations | | | 1.161 | (0.853, 1.579) | 1.288 | (0.938, 1.769) |
| State health organizations | | | 1.286 | (0.931, 1.777) | 1.256 | (0.905, 1.742) |
| National health organizations | | | 1.103 | (0.799, 1.522) | 1.103 | (0.801, 1.519) |
| News articles | | | 1.029 | (0.736, 1.438) | 0.962 | (0.680, 1.359) |
| Meritocratic beliefs | | | | | 0.438 | (0.264, 0.725) |
| Diversity beliefs | | | | | 1.528 | (1.114, 2.553) |

**Table 3.** Stratified models by low *vs.* high meritocratic beliefs and by low *vs.* high diversity beliefs.

| | Low meritocratic beliefs | | High meritocratic beliefs | | |
|---|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI | Interaction p |
| Friends | 1.9 | (1.208, 2.991) | 0.471 | (0.257, 0.864) | 0.195 |
| Family | 1.082 | (0.713, 1.643) | 1.118 | (0.676, 1.849) | 0.892 |
| Scientists and experts | 1.694 | (1.125, 2.552) | 1.924 | (1.051, 3.522) | <0.001 |
| My doctor | 0.923 | (0.607, 1.403) | 2.261 | (1.247, 4.101) | 0.044 |
| Local health organizations | 1.661 | (1.074, 2.569) | 0.822 | (0.474, 1.425) | 0.613 |
| State health organizations | 0.919 | (0.582, 1.451) | 1.974 | (1.086, 3.590) | 0.067 |
| National health organizations | 1.751 | (1.126, 2.724) | 0.794 | (0.452, 1.394) | 0.904 |
| News articles | 0.859 | (0.540, 1.368) | 0.892 | (0.496, 1.606) | 0.973 |
| **Low diversity beliefs** | | | **High diversity beliefs** | | |
| | OR | 95% CI | OR | 95% CI | Interaction p |
| Friends | 1.445 | (0.990, 2.109) | 0.445 | (0.201, 0.981) | 0.374 |
| Family | 1.282 | (0.897, 1.833) | 0.951 | (0.495, 1.830) | 0.407 |
| Scientists and experts | 1.484 | (1.025, 2.149) | 2.884 | (1.428, 5.823) | <0.001 |
| My doctor | 1.13 | (0.785, 1.628) | 1.755 | (0.820, 3.756) | 0.091 |
| Local health organizations | 1.517 | (1.031, 2.234) | 1.25 | (0.649, 2.409) | 0.416 |
| State health organizations | 1.02 | (0.702, 1.482) | 2.118 | (1.059, 4.238) | 0.041 |
| National health organizations | 1.185 | (0.813, 1.728) | 0.95 | (0.498, 1.810) | 0.756 |
| News articles | 0.997 | (0.666, 1.490) | 0.657 | (0.321, 1.344) | 0.679 |

**Note:** All models are adjusted for race, household income, religion, occupation, gender, ethnicity, age, and political ideology.

## Discussion of study-1

Trust in scientists and medical and infectious disease experts was the sole factor significantly associated with vaccination intention for all samples. This is consistent with previous studies emphasizing the importance of trust in experts in vaccine uptake across all generations [2,25]. Those who hold weaker meritocratic beliefs or stronger diversity beliefs would be more likely to get vaccinated in the near future. To the best of our knowledge, this is one of the first pieces of evidence suggesting that meritocratic and diversity beliefs could help better understand Gen Z its COVID-19 vaccine uptake.

Results from the stratified samples showed that trust in one's own doctors was more significantly associated with higher odds of vaccination intention for those with (high *vs.* low) meritocratic beliefs. This suggests that doctors might signify the positive outcomes of good education, ambition, and hard work. Thus, trust in one's own doctors could be more strongly associated with vaccination intention among unvaccinated Gen Zers with stronger meritocratic beliefs. Moreover, trust in state health organizations was more significantly associated with higher odds of vaccination intention for those with (high *vs.* low) diversity beliefs. This result echoes the importance of diversity in race, religion, and gender in gaining Gen Z's trust in state government sources [47].

The findings from Study 1 provide a novel perspective on the role of meritocratic and diversity beliefs in the relationship between understanding unvaccinated Gen Zers' trust in information sources and COVID-19 vaccination intention. Using a qualitative approach, Study 2 hopes to elaborate on the ways in which Gen Zers both establish or lose trust in information sources and how it influences their decision to receive COVID-19 vaccines.

## Results of study-2

We focused on trust and source selection in the analysis of interview data, and we found two themes. Each theme is described below in more detail.

Strong trust in doctors and experts, while wavering confidence in government sources and media Participants struggled with trust when investigating information and deciphering the science behind COVID-19 vaccination. It was the consensus of our sample that local, family doctors were more trustworthy than state or national news sources, because they had a formal medical training and a history with the participants' family, and they experienced the pandemic from the frontlines. Participants reported being more compliant with vaccine recommendations when given by their own doctor.

"The first set of the people I can say I don't trust are these media people. In fact, if there is a person I can trust, I believe it is doctors" (Participant 26, Focus Group 7).

"I agree with doctors. I would trust most doctors because they've been through eight plus years of school, especially those who do research. I trust anyone pretty much who works in the medical field" (Participant 8, Focus Group 2)

Federal or national government sources were perceived by participants as untrustworthy sources of COVID-19 information, especially when the public was offered monetary incentives to be vaccinated. Some believed that the monetary incentive was the proof of government ill-will and fueled misinformation.

"I don't trust the CDC as much as other people because I think it might be government controlled" (Participant 3, Focus Group 1).

"If you get the vaccine, you get a $100 gift card, you could win a car. I don't really understand why that is, and like if it was so important for people to get the flu shot, why can't there be an incentive for like another type of vaccine too? " (Participant 12, Focus Group 3).

Gen Z wanted to know the source of information and have a certain level of familiarity with them that could inform the relationship. Additionally, the relationship with local family doctors included a two-way communication component where participants reported having discussions about vaccinations, whereas the relationship with government sources was only one-way communication.

"My health care provider has actually been like a family doctor for a while, you know the trust has been there for a while. You know from my parents, and then I myself I have been treated by him for a while. The relationship is professional, but then there's still some friendliness but then discussions about it" (Participant 1, Focus Group 1).

As the science of COVID-19 evolved and experts' knowledge increased, so did the news reporting and government guidance. However, due to the public's low health literacy and the political divide, much of the information about COVID-19 vaccinations was not understood or accepted by the public.

**Persuading without convincing related to vaccination:** "The data analysis revealed a tension in the sample among friends and family who have been vaccinated. We labeled this theme, persuading without convincing related to vaccination. Some participants mentioned that those who have been vaccinated just followed government mandate orders and did not do their own research.

It stresses me out that they're making all these mandates, like my fiancé works for the government, so he had to get the vaccine and he didn't trust it. I'm sure there was a lot done but not enough research" (Participant 8, Focus Group 2).

None of the participants discussed what information specifically was believable or not believable about COVID-19, but they rather focused on the source. Participants felt that much information disseminated from government agencies and pharmaceutical companies was biased and could not be trusted. Additionally, news outlets and government agencies sometimes reported information at different times, seemingly confusing the public.

"I think I would still be kind of apprehensive because of the way that media and the news and the government kind of like put it on a pedestal" (Participant 11, Focus Group 3).

"I feel like the news is just twisted up and they change their stories and stuff and they're kind of hard to trust" (Participant 14, In-Depth Interview 1).

Many misunderstood the protection the COVID-19 vaccination provides. They thought since people who were vaccinated caught the virus, the vaccination was not effective and thus, not worth being vaccinated. This then validated participants' feelings of mistrust of the vaccine.

"I question getting a vaccine that won't protect you from getting virus" (Participant 19, Focus Group 40).

Participants expressed discord among their usual network of trusted sources, e.g., parents, grandparents, friends, government, and political figures. This presented challenges for them in deciding what to believe and what action to take related to vaccination. They felt persuaded that COVID-19 is real and that there is an effective vaccine (for some, those not "healthy"), but most did not feel compelled to become vaccinated.

"It has divided families, I have a friend, whose family won't let them come for Christmas because they weren't vaccinated" (Participant 6, Focus Group 2).

Participants discussed trusting sources but not agreeing with their point-of-view. Most participants felt comfortable disagreeing with these trusted sources and discussing their intentions related to vaccination.

### Discussion of study-2

Many of the Gen Z participants in this sample expressed trust issues with media and government sources related to COVID-19 vaccination. There was vaccine hesitancy among participants due to the perceived ever-changing and sometimes contradicting information gathered from usually trusted sources. Participants may not have enough science literacy and therefore, not understand that science evolves as more is learned from research. Moreover, people who had been vaccinated contracted COVID-19, and therefore, this somehow discounted the efficacy of the vaccine.

Qualitative data also indicated that this generation is unfamiliar with vaccinations and may not understand the science or related impact to public health. It might also be said that generations senior to Gen Z, e.g., Millennials and Generation X, who are parents to Gen Zers, also are unfamiliar with the history of vaccines in the U.S., and why there has been such an emphasis on herd immunity. This finding points to the need to educate Gen Z and possibly, beyond on public health through effective science communication efforts and the necessity of vaccines and herd immunity.

We conducted an online survey (Study 1) and focus groups and in-depth interviews (Study 2) by recruiting unvaccinated Gen Zers residing in Grand Forks County, ND in March 2022. The goal of this research was to understand the ways in which Gen Zers establish or lose trust in information sources and its influences on their decision to receive COVID-19 vaccines in conjunction with their beliefs about meritocracy and diversity.

The theory of planned behavior posits that intention is critical to action [3]. This research sought to hone in on key attributes of Gen Z's core beliefs that influence their attitudes toward COVID-19 vaccine uptake. The findings of this study in that vaccine-related trust is a multi-dimensional construct, existing within trust in the broader society [21]. Thus, meritocratic and diversity beliefs should further be explored in Gen Zers' trust in COVID-19 vaccine and its information sources. It might be a futile attempt to understand Gen Z as a homogenous group who is different from previous generations based on their ages only. Core beliefs, such as meritocratic and diversity beliefs, deserve additional empirical attention for Gen Z to better navigate the pandemic.

We speculated that doctors might be a manifestation of good education, ambition, and hard work leading to success based on a stronger relationship between trust in one's own doctors and vaccination intention among unvaccinated Gen Zers with high meritocratic beliefs. Data from Study 2 somewhat supported the speculation, as participants shared their appreciation of doctors' medical training and education and their experiences with the pandemic from the frontlines. These findings suggest that public health communication efforts might have to start from medical training and education [46]. Doctors who are keenly aware of their influence on patients navigating an uncertain situation in addition to treating them would make a huge difference.

A growing concern about wavering trust in governmental sources regarding COVID-19 information was prominently shared by participants in Study 2. They also emphasized that it was monetary incentives that resulted in losing trust in governmental sources. The stratified sample findings from Study 1 show a glimpse of hope, however. That is, rebuilding trust in governmental sources among Gen Z might need to begin from intentionally incorporating diversity components in health and science education for this generation. These findings inform the creation of health education and promotion aimed at Gen Z. Using these messaging strategies would appeal to this generation's core beliefs. Future research should seek to test the effectiveness of using meritocratic and diversity beliefs in health communication messaging to Gen Z.

Political ideology was not significantly associated with vaccination intention in any logistic regression models, which is inconsistent with previous studies [13-16, 22, 23, 33]. This finding underscores the useful applicability of meritocratic and diversity beliefs in replacement of conservative and liberal political ideologies to vaccination intention at least among unvaccinated, hesitant Gen Zers. Teasing out the attributes of Gen Z's behavioral beliefs and ultimately attitudes

toward receiving COVID-19 vaccines will allow for targeted health communication that better compels members of this age group to be vaccinated.

This study has several limitations. First, both studies used a convenience sample recruited from social media and online promotions, limiting the external validity of findings. Second, the findings might not be applicable to other regions in the U.S. or worldwide. Finally, a portion of participants in Study 1 were a few years older than Gen Z due to the recruitment challenge.

## Conclusion

Despite the limitations, this study suggests that public health professionals should continue to invest in leveraging different sources of health and science communication. Particularly, data indicate that trust in scientists and infectious disease experts are associated with higher vaccination intention. An effort to help scientists and infectious disease experts better translate scientific, peer-reviewed evidence into consumable content is warranted. The Your Local Epidemiologist is an example of successful communication efforts. Moreover, given a high level of trust in local family doctors, similarly reported in previous studies, their offices could serve as an indirect source of health and science education connecting government sources with the Gen Z population. Finally, as indicated in findings from Study 2, two-way communication efforts where it provides the public with a safe place to freely discuss their concerns about the safety and efficacy of vaccines could contribute to gaining Gen Zers' trust.

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## Declarations

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### Conflict of interest statement

None

### Implications and contribution

Unvaccinated Gen Z tends to lose trust in government sources and media due to perceived ever-changing and sometimes contradicting information. Nonetheless, their beliefs in meritocracy *vs.* diversity can help better understand whether trust in one's own doctors or state health organizations would be more likely to lead to vaccination intentions.

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