



# A qualitative study exploring attitudes and perceptions of the COVID-19 booster vaccine in minority ethnic individuals in North East England

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## Abstract

**Objectives** COVID-19 booster vaccine uptake among minority ethnic individuals in the United Kingdom has been lower than in the general population. This is the case not only for the first and second dose of the vaccine, but particularly for the booster dose. However, little research has examined psychosocial factors contributing to vaccine hesitancy in minority ethnic individuals. This study conducted a qualitative exploration, informed by Protection Motivation Theory, of attitudes towards and perceptions of the COVID-19 booster vaccination among ethnic minority individuals in North East England.

**Design** Semi-structured interviews were conducted with 16 ethnic minority individuals (11 females, five males) aged between 27 and 57, residing in North East England.

**Results** Inductive thematic analysis showed that perceived susceptibility to COVID-19 influenced vaccination decisions. Perceived response costs acted as barriers to COVID-19 booster vaccination among interviewees, in the form of time constraints and a perceived lack of practical support in the event of experiencing side effects from the vaccine. There was a lack of confidence in the vaccine, with individuals seeing it as lacking sufficient research. Participants also spoke of medical mistrust due to historical events involving medical experimentation on minority ethnic individuals. Interviewees suggested involving community leaders in addressing people's concerns, misassumptions, and lack of confidence in COVID-19 vaccination.

**Conclusion** Campaigns to increase COVID-19 booster vaccine uptake need to be designed to address physical barriers towards vaccination, misconceptions, and a lack of confidence in the vaccine. Further research needs to determine the effectiveness of enlisting community leaders in these efforts.

**Keywords** COVID-19 · Vaccine hesitancy · Ethnic minorities · COVID-19 booster vaccine

## Introduction

Efforts to vaccinate the world population against COVID-19 are ongoing. By September 2022, nearly 68% of the world population had received at least one dose of the vaccine (Our World in Data 2022). The COVID-19 booster vaccination programme has been rolled out rapidly across the United Kingdom (UK). Uptake has been encouraging but lower than that of the first and second dose (GOV.UK 2022). Surveys have indicated that there are a significant number of people who are sceptical of the vaccine, and who would either be hesitant to receive it, or refuse it altogether (Freeman et al. 2020a, b; Office for National Statistics 2021). In the UK, most people hospitalised with COVID-19 are those who have not been fully vaccinated (Mahase 2021). To reduce hospitalisations and mortality rates, it is important that as

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many eligible individuals as possible are fully vaccinated against COVID-19.

### Vaccine hesitancy in minority ethnic individuals

Vaccine hesitancy refers to “delay in acceptance or refusal of vaccination despite availability of vaccination services. Vaccine hesitancy is complex and context-specific, varying across time, place, and vaccines. It is influenced by factors such as complacency, convenience, and confidence” (MacDonald 2015, p. 4163). Few studies have examined factors underlying COVID-19 vaccine hesitancy or refusal in minority ethnic individuals in the UK, although uptake of the COVID-19 vaccine has been slower in minority ethnic communities (Gaughan et al. 2022). Medical mistrust plays a role in vaccine hesitancy or refusal in these communities (Allington et al. 2021; Thompson et al. 2021). Our previous research found that among individuals with African, Bangladeshi, Caribbean, and Pakistani ethnicity, mistrust of the government and pharmaceutical companies was common, and what were perceived to be mixed messages about the vaccine from a variety of sources left individuals feeling confused (Eberhardt et al. 2022). However, there has been little research into which psychosocial factors drive COVID-19 booster vaccine acceptance and uptake in ethnic minority individuals (Kamal et al. 2021).

### Protection motivation theory and vaccination intention

Psychological research has identified three drivers of vaccine uptake, in addition to possessing the necessary knowledge: an enabling environment, social influences and motivation (World Health Organization 2020). Protection Motivation Theory (PMT) (Rogers 1975) attempts to explain motivation to respond to health threats such as COVID-19. According to PMT, the likelihood of engaging in a protective behaviour — such as being vaccinated — when faced with a threat is a product of the beliefs that individuals hold about engaging, or not engaging, in this protective behaviour as well as about the threat itself. Thus, in PMT intention to get vaccinated for COVID-19 is influenced by one’s *perceived severity* of the disease, *perceived susceptibility* to contracting and becoming seriously ill with COVID-19, *perceived ability* to get vaccinated (*self-efficacy*), *perceived effectiveness* of the vaccine (*response efficacy*), the *perceived costs* of getting vaccinated (*response costs*), and the *perceived rewards* of *not* getting vaccinated (*maladaptive response rewards*).

Our previous work used PMT to predict COVID-19 vaccination intention in the general UK population (Eberhardt and Ling 2021a, 2022a), in young people (Eberhardt and Ling 2022b), and in minority ethnic individuals (Eberhardt and Ling 2021b). It is important that psychological theories

of health behaviour, such as PMT, be applied to COVID-19 booster vaccination acceptance and intention in ethnic minority groups in North East England, as this will facilitate the design of psychosocial theory-based interventions to increase its uptake. However, studies so far have usually used a quantitative approach, and have therefore not gathered in-depth information on the attitudes and perceptions underlying these factors driving COVID-19 vaccination intention.

Apart from the factors discussed so far, misinformation perpetuated by social media may influence the decision to get the COVID-19 booster vaccine. The emergence of social media has encouraged the spread of misinformation and misconceptions around COVID-19 vaccines, and has exacerbated hesitancy to get vaccinated for COVID-19 (Wilson and Wiysonge 2020). There is no research examining how social media use affects intention to receive the booster dose, particularly within ethnic minority groups. However, any attempt to improve the uptake of the COVID-19 booster vaccine need to consider the influence of social media use on vaccination behaviour.

In light of the lower uptake of the COVID-19 booster vaccine, understanding COVID-19 booster vaccination intention in ethnic minority individuals in North East England is essential to designing theory-based interventions and public health campaigns addressing vaccine uptake in this group. Furthermore, there is a lack of theory-informed research employing qualitative methods to provide an in-depth exploration of attitudes and perceptions of the COVID-19 booster vaccine among minority ethnic communities in the UK. Health inequalities are worsening in North East England, with significant challenges to health, and lower life expectancy compared to the rest of England (Marmot 2020; Corris et al. 2020). Therefore, we aimed to qualitatively explore COVID-19 booster vaccination intention in ethnic minority individuals in North East England.

## Method

### Design and participants

This study used a qualitative approach, employing semi-structured interviews. Participants were recruited using social media, the researchers’ own networks, and word of mouth. Those interested in participating were directed to the study website, which provided information on the project and contained a contact form to express their interest in taking part in an interview. We included both individuals who had and who had not received the booster dose, to elicit a breadth of responses which would allow for an understanding of the attitudes and perceptions underlying the decision to get the booster vaccine, as well as hesitancy or refusal to do so.

A total of 16 participants (11 females and five males) took part in semi-structured interviews. Of these, five had received the booster vaccine and 11 had not (see Table 1). Interviews lasted between 30 and 45 minutes.

## Measures

We used an inductive approach, employing semi-structured one-to-one interviews. This approach does not make assumptions, thereby allowing findings to emerge from the themes in the data (Thomas 2006). Also, semi-structured interviews allow the interviewer to deviate from the order of the questions and explore answers in depth (Barriball and While 1994). Moreover, probing in interviews can help to develop a sense of rapport with the interviewee, thus mitigating the limitations of online interviewing and social desirability. The interview guide was developed to be flexible and avoid leading questions, to elicit participants' own views rather than imposing views on interviewees (see Table 2); this allowed themes to emerge organically from the data. Interviews were conducted online using Microsoft Teams, and recorded for transcription.

## Procedure

Data collection took place from April to August 2022. The second author collected the data. Ethics approval was granted by the third author's institution's research ethics committee. Individuals eligible to participate in the study included anyone aged 18 or older, belonging to an ethnic

minority, and residing in North East England. The study website address was disseminated via social media, emails to ethnic minority-relevant organisations, distributing flyers in person, and within the researchers' own networks. Interviewees received a £20 shopping voucher for their participation. As the interviews progressed, data saturation was observed with the recurrence of similar thoughts and experiences, at which point data collection was terminated (Fusch and Ness 2015).

## Analysis

Inductive thematic analysis (Braun and Clarke 2006) was performed on the interview transcripts by the first and the third author. We firstly familiarised ourselves with the data by reading and re-reading the responses. Next, codes were identified independently by both authors, and subsequently themes were created. The fourth step involved reviewing the themes, and in the fifth step, they were named. Subsequently meetings were held between the two authors where the themes were reviewed and discussed until a consensus had been reached. Finally, the themes were written up by the first author. Although coding is subjective and interpretative, and coding by multiple individuals is not necessary to enhance rigour (Braun and Clarke 2019), we felt it important that at least two researchers be involved in the analysis. The study was reported according to the Standards for Reporting Qualitative Research (SRQR) (O'Brien et al. 2014).

**Table 1** Demographic characteristics of participants

Participant number	Age	Gender	Level of education	Ethnicity	Received COVID-19 booster vaccine?
1	27	Female	Advanced level qualifications (equivalent to high school diploma)	Black African	No
2	49	Female	Bachelor's degree	Black African	No
3	37	Female	Master's degree	Black African	No
4	33	Male	Master's degree	Indian	No
5	37	Female	General Certificate of Secondary Education	Black African	Yes
6	30	Female	Doctorate	Indian	Yes
7	39	Female	Not provided	Black British	No
8	40	Female	General Certificate of Secondary Education	White East European	No
9	27	Female	Advanced level qualifications (equivalent to high school diploma)	Black African	No
10	57	Female	General Certificate of Secondary Education	Black African	Yes
11	51	Male	Bachelor's degree	Black African	No
12	41	Male	Master's degree	Black African	Yes
13	32	Female	Master's degree	Black African	No
14	36	Male	Advanced level qualifications (equivalent to high school diploma)	Black African	No
15	49	Male	Advanced level qualifications (equivalent to high school diploma)	Black African	No
16	48	Female	Master's degree	Black African	Yes

**Table 2** Interview guide

Questions for all participants	Questions for unvaccinated participants	Questions for vaccinated participants
Please tell me about how you've experienced the COVID-19 pandemic.	What would help you feel more confident about the COVID-19 vaccine?	Have you had the COVID-19 booster vaccine?
What are your thoughts on the COVID-19 vaccine?	Are there any circumstances under which you could see yourself getting vaccinated for COVID-19? (If yes, what are these? If not, why not?)	Will you get the COVID-19 booster vaccine next time it is offered to you? Why/why not?
Are you vaccinated for COVID-19? Why/why not?	What are your thoughts on minority ethnic people when it comes to the COVID-19 vaccine? Why do you think they are more likely to hesitate to take the vaccine?	Are there any circumstances under which you could see yourself NOT getting vaccinated for COVID-19?
Have you received a booster dose of the vaccine? Why/why not?	What do you think would be helpful to encourage minority ethnic people to take the vaccine?	What are your thoughts on minority ethnic people when it comes to the COVID-19 vaccine? Why do you think they are more likely to hesitate to take the vaccine?
Can you tell me about your decision to get vaccinated/not to get vaccinated?	Where do you go to for health information? (Which information sources do you trust most?) Why?	What do you think would be helpful to encourage minority ethnic people to take the vaccine?
How do you feel about vaccines generally (e.g., childhood vaccinations, flu vaccine, tuberculosis vaccine)?	Which information sources do you trust most when it comes to the COVID-19 vaccine? Why?	Where do you go to for health information? (Which information sources do you trust most?) Why?
Is there anything else you'd like to add?	Which information sources do you trust least when it comes to health information? Why?	Which information sources do you trust most when it comes to the COVID-19 vaccine? Why?
		Which information sources do you trust least when it comes to health information? Why?

## Results

Five themes and five subthemes emerged from the semi-structured interviews (see Table 3). These are described in the following subsections.

### Perceived vulnerability to COVID-19 and side-effects of the vaccine

Participants expressed their views on their own vulnerability to COVID-19, as well as the views of others around them. One participant mentioned the idea that their ethnicity conferred an increased vulnerability to side-effects of the vaccine:

*Some of my friends from Africa, I've seen this fear that if you get [a] vaccination, how safe we are, there's a question. Because, you know, there will be some negative [effects], like 5 to 10%. But they don't see the positive 90%. They just look for the 10% and then mostly they're staying away from vaccination. (Participant 4)*

Others spoke of the view that their ethnicity was associated with a decreased vulnerability to COVID-19 and that there therefore was no need to get vaccinated:

*Africa was, I think, the last part [of the world] where COVID came out. [...] It didn't hit so much. So that thing also made [people] think that Africans can't get it. (Participant 5)*

*Back home in Africa, the majority of people didn't get vaccinated. They go through the pandemic, and everybody is fine. Some of them got it [COVID-19]. Some of them didn't get the vaccination, but they're surviving, and people's lives continue. [...] The government [...] shouldn't be worried about people passing COVID to others, because now we're normalising, our life [has] become normal, everybody's doing whatever he's doing in his life' (Participant 15)*

Thus, ethnicity was seen as a reason not to get vaccinated, as it was assumed that it afforded a natural protection from negative effects of COVID-19. Another participant stated that they were not afraid of dying of COVID-19:

*Maybe it is because I'm not scared of that [...]. So, if I die? You know what I mean? I'm not scared. I'm not scared. (Participant 8)*

### Negative experiences with the COVID-19 vaccine

Negative experiences with the COVID-19 vaccine were a major deterrent to getting booster vaccines. Some had experienced these negative effects themselves:

*Things have happened to me. [...] I didn't I didn't get any aftercare. I didn't like that. (Participant 7)*

However, most people who spoke about negative experiences had not experienced these directly; rather, they were deterred by others close to them having suffered side-effects:

*I'm scared [of] getting that vaccination. [...] My husband and my friend, after they're getting the first dose, they're not feeling very well. That makes me [...] not getting that vaccine. And every time I tell myself, like, I need to get it. But when I see people suffering, that's why I stopped to take that vaccine. (Participant 1)*

*My wife now chose not to get a booster because she says she reacts to this vaccine, the first and second vaccination she had a lot of reaction. And it was obvious, I also reacted. [...] And you know, my hand pain was there. Yeah. And it wasn't a nice experience. So that has deterred my wife from saying she wants to get a booster. (Participant 12)*

Such vicarious experiences were felt to be an important factor in the decision to get vaccinated. It was seen as important to share these experiences with others:

**Table 3** Themes from thematic analysis of interviews

Theme	Subthemes
1. Perceived vulnerability to COVID-19 and side-effects of the vaccine	
2. Negative experiences with the COVID-19 vaccine	
3. Negative views related to COVID-19 vaccination	<ul style="list-style-type: none"> <li>a. The COVID-19 booster vaccine as inconvenient or unnecessary</li> <li>b. Lack of confidence in the COVID-19 vaccine due to its 'hasty' development</li> <li>c. Lack of trust due to historic events involving medical experimentation on ethnic minorities</li> </ul>
4. The influence of social media on COVID-19 vaccination intention	
5. Strategies to increase confidence in the COVID-19 vaccine	<ul style="list-style-type: none"> <li>a. Enlisting community leaders</li> <li>b. Education</li> </ul>

*The people who have taken the vaccination, if they talk, if they can share their experience there, there might be some[thing] useful to the others to get vaccinated.* (Participant 4)

However, others were aware that although side-effects were quite common (with the majority of them being minor), they should not necessarily act as deterrents to get vaccinated; rather, being poorly informed about COVID-19 vaccination side-effects led to individuals not getting vaccinated:

*Due to the poor knowledge of vaccines, [people] will hesitate to take it because when we are vaccinated, we may feel sick for two days.* (Participant 6)

To summarise, a number of participants were deterred from COVID-19 booster vaccination due to direct or indirect negative experiences with the vaccine.

### Negative views related to COVID-19 vaccination

Negative views of COVID-19 vaccination were common among participants. These centred on perceived properties of the booster vaccine, the ‘hasty’ development of the vaccine, and a lack of trust as a result of historical events involving medical experimentation on ethnic minorities.

#### The COVID-19 booster vaccine as inconvenient or unnecessary

Most participants who had not received the booster vaccine reported that they had not done so due to either a lack of time, or a lack of confidence in the vaccine. A lack of time was a common factor:

*I haven't yet. [...] I've not had time.* (Participant 3)  
*I haven't gone for [the booster] because of work schedules.* (Participant 11)

Others felt the booster vaccination was inconvenient for other reasons, such as a lack of support in case they experienced side-effects:

*As I'm staying alone, I have a fear that if I get something a fever or something, which [is] beyond my control, if I get hospitalised.* (Participant 4)

Yet others perceived the booster vaccine to be unnecessary, due to having previously been infected with COVID-19 and having had both a first and second dose. Thus, prior infection was seen as a substitute to the booster vaccine:

*If there is more information telling us what is going on, [...] probably, I will take it, but at the moment, I feel like everything [COVID-19] has died out. No one talks about it anymore. I got my two jabs, you know, I got the virus, so my body probably got a few more*

*antibodies from me fighting off the virus, you know, so I'm not in a hurry.* (Participant 14)

Some believed that they only needed the booster vaccine if they were classed as vulnerable, and so had chosen not to get it:

*[The National Health Service] was saying, and actually the government in general, it was [for] people with existing conditions [...] are highly recommended to get the booster. So since I felt like I wasn't [...] under that category, I felt like I had no need to.* (Participant 9)

Others thought that the booster would be necessary only as case numbers rose, for example, in the winter, and therefore chose to delay getting the booster vaccine:

*I'm planning to have the booster maybe during winter-time, because I know that there might be maybe high cases of COVID-19 because of change of weather. So, I'm planning to take my booster at that time. But at the moment, I am happy with the first and second [dose].* (Participant 13)

In sum, many saw the COVID-19 booster vaccine as inconvenient or unnecessary.

#### Lack of confidence in the COVID-19 vaccine due to its ‘hasty’ development

Many participants expressed a lack of confidence in the COVID-19 vaccine due to its ‘hasty’ development. They felt that not enough was known about the vaccine and potential negative side-effects, and therefore it was seen as unsafe.

*On social media [there was] this clip I saw of a guy who said he was a doctor and saying, you know, don't take the vaccine it's [...] going to have this effect in the body, the research is not enough. [...] It's been rushed.* (Participant 14)

Interviewees believed that, unlike other vaccinations, the COVID-19 vaccine did not have enough research and development behind it:

*I took all [the] vaccinations for the flu, tuberculosis, hepatitis. But [these are] general vaccinations, like anyone, they have to take them. But [...] the [COVID-19 vaccine] from 2019 until now, [they are telling] people you have to take this vaccination.* (Participant 1)

*If I get vaccinated, maybe my blood type will not accept [it], maybe I get [a] blood clot. So, my worry is now because they didn't identify a particular group of people what type of blood that they get the blood clot. There's [...] not much research. So,*

*we can just do something and then later on, you're going to feel yourself there's a problem. So that's why I stand with my position.* (Participant 15)

*The people for vaccination are not explaining to us the mechanism of the vaccine in the body. So those people against the vaccine have more information than the people [in favour of the vaccine].* (Participant 13)

Thus, a perceived lack of knowledge, research, and development in relation to the COVID-19 vaccine was a source of vaccine hesitancy among participants.

### **Lack of trust due to historic events involving medical experimentation on ethnic minorities**

Several participants expressed a lack of confidence in the COVID-19 vaccine due to historic events involving medical experimentation on ethnic minorities:

*Mistrust [...] has been building up in [...] especially African countries and people with African descent. [...] When you were growing up, this was information that was going around. [...] There was also an attempt during apartheid in South Africa, when doctors tried to sterilise African women, or hospitals infecting men and women with HIV.* (Participant 14)

*They said they brought COVID, HIV to Nigeria, there has been a lot of experiments being done to black people. And that has reduced their confidence in that our people are not involved. [...] I think there has been a history of an incident that they have maybe come to Africa to test one or two drugs. So, in this situation, anything that is made abroad, there is always a [...] question mark, because people will always think, are they coming in again? [...] I don't know, I've never really read the history. [...] These are the things that break our confidence.* (Participant 13)

These historic events which participants reported being aware of resulted in a mistrust and suspicion of COVID-19 vaccination:

*They are not our culture. They're not our thing. We don't believe in vaccines. [...] Especially when you look at what people were saying telling each other that [...] they're going to kill you. If you get these vaccines, you're going to die. They want to kill you. All those things which are coming up saying don't take vaccines, these vaccines will actually make you die. And you see our own people that [are] dying more.* (Participant 10)

### **The influence of social media on COVID-19 booster vaccination intention**

Some participants held the view that social media were a useful source of information on COVID-19 vaccination:

*I believe there's always a truth inside [social media].* (Participant 5)

However, overall, participants were sceptical of the information on the COVID-19 vaccine disseminated on social media. Many doubted its accuracy.

*I try not to listen to this information, because they can't be convincing, like, especially people on social media like these doctors, [...] there's one person who [...] called himself a doctor. And it wasn't Facebook saying, even the masks [...], they reduce the level of oxygen in your body. And then I'm thinking [...] these doctors who go to theatres and carry out, like, operating, you know, operations for hours and hours. And they are fine.* (Participant 14)

*But not every statement posted in the social media is true. Unless we visit a website or we visit the accurate apps or the clear website, we don't get the proper information. Fake news spreads so fast.* (Participant 6)

One participant suggested that only official social media accounts, such as that of the NHS, should be trusted:

*In the social media, sometimes we may get some information, which is maybe [inaccurate] sometimes, but if you follow the official channels of NHS, [...] we can get the right information.* (Participant 4)

It was suggested that social media should be used as a tool to educate people about COVID-19 vaccination:

*People are actively engaged in social media. So, if we get something, [...] the advertising [...] on Facebook or maybe like LinkedIn, like YouTube, if you [tell] people to get the vaccination, [...] advertise [it] in the media.* (Participant 4)

Others, however, did not think that using social media to promote COVID-19 vaccination was effective:

*Everything has been done. [...] It is always on the media, social media, but they don't care. They don't care.* (Participant 5)

In sum, although views on the usefulness and trustworthiness of social media in relation to COVID-19 vaccination were mixed, the dominant view was that social media are an unreliable source of information, with the exception of official social media accounts, such as those of the NHS.

## Strategies to increase confidence in the COVID-19 vaccine

Participants proposed a range of suggestions for increasing ethnic minority individuals' confidence in the COVID-19 vaccine. Suggestions focused on two areas: enlisting community leaders in any strategies to increase vaccine confidence and providing education on the vaccine.

### Enlisting community leaders

Many participants held the view that the best way to increase ethnic minorities' confidence in getting vaccinated for COVID-19 was to enlist community leaders in these efforts. As one participant explained:

*The African communities are very religious and [...] when [someone] like a pastor, then whatever they say this, like, it's the truth. So, if [the pastor] does not believe in the vaccine, it's going to influence thousands of people. (Participant 14)*

The participant suggested to get these leaders involved in promoting COVID-19 vaccination:

*I think you need to go to the communities and get the people, the community leaders, the people who are trusted in the communities who see people on a daily basis. (Participant 14)*

Another participant remarked that they would like to see people from within their own ethnic group who were involved in the development of the vaccine help promote COVID-19 vaccination:

*If we have more Black people in a top position in [the] biopharmaceutical industry where they make vaccines, then they can confidently tell us [...] what is involved. And then, you know, we tend to believe our people. (Participant 13)*

Similarly, another participant remarked:

*I think we should have more people that will give our people an awareness of these things, you know? [...] That's the problem, that's where we're lacking, we need to have our people in a top position. [...] For instance, somebody from this organisation could be called in[to] a team or other organisation, organised by African people. And then they will give them a lecture about what the vaccine is all about. (Participant 14)*

## Education

Another important strategy for increasing confidence in the COVID-19 vaccine proposed by participants involved education. As one participant explained:

*If we educate the person, he may understand and he may [...] volunteer himself to take the vaccine. Unless we teach or we [...] explain or we make them understand they will not take [the vaccine] so [...] we need to educate them. (Participant 6)*

Another participant expressed a similar view, adding that the negative influence of social media needed to be addressed as part of this education:

*[Education is] the most important thing, just telling [hesitant individuals] that vaccines are not like what you think the vaccines are. Don't listen to social media. Some of the things that have been said on social media are not true. (Participant 10)*

Thus, education and enlisting community leaders to increase confidence in the vaccine were seen to be the most effective methods for addressing COVID-19 vaccine hesitancy.

## Discussion

This study used a qualitative approach to explore attitudes towards and perceptions of the COVID-19 booster vaccination intention in people from ethnic minorities living in North East England. We found that specific attitudes, beliefs, and experiences in relation to the COVID-19 vaccine, some of which reflected PMT constructs, played a role in the decision to not receive the booster vaccine. Some participants believed they were less vulnerable to suffering negative consequences of COVID-19 due to their ethnicity, and therefore saw no need to get vaccinated, whilst others saw themselves as more vulnerable to COVID-19 due to their ethnicity. The association between perceived susceptibility to COVID-19 and vaccination intention has been demonstrated in our prior research using PMT with the general UK population (Eberhardt and Ling 2021b; Eberhardt et al. 2022) and among minority ethnic individuals in the UK (Eberhardt and Ling 2021b; Eberhardt et al. 2022).

Negative beliefs about the booster vaccination also played a role in the decision to get vaccinated. Many saw the booster vaccine as an inconvenience, or as unnecessary. This corresponds with our previous findings on perceptions of COVID-19 vaccination in the general UK population (Eberhardt and Ling 2022a). In terms of PMT, perceived response costs (i.e., the inconvenience of getting vaccinated) influenced participants' decision not to get the



booster dose; this emphasises that work is needed in relation to conveying the importance of the booster vaccine, as well as making it as convenient as possible for people to receive the vaccine in order to reduce maladaptive response rewards.

A particularly salient finding that emerged from the interviews concerned their lack of trust in the vaccine, which appeared in part to be rooted in historical events involving medical experimentation with minority ethnic individuals. As our previous research uncovered similar perceptions among minority ethnic groups in the general UK population (Sagoe et al. 2022; Charura et al. 2022; Magee et al. 2022; Eberhardt et al. 2022), these concerns should be taken seriously: addressing the fear and mistrust associated with individuals' perceptions of these events is central to increasing their confidence in COVID-19 vaccination and is therefore likely to improve uptake.

The findings on the perceived importance of social media with regard to COVID-19 booster vaccination were mixed, with some individuals using social media as a key source of information on vaccines, whilst many more were sceptical about the accuracy and trustworthiness of this information. The role of social media in decision-making around COVID-19 vaccination is not yet fully understood, and therefore warrants further exploration. Some participants suggested that social media should be used to increase ethnic minority groups' confidence in COVID-19 vaccination; this has also been suggested elsewhere (Wilson and Wiysonge 2020). Therefore, despite our mixed findings, the potential usefulness of social media as part of efforts to combat COVID-19 vaccine hesitancy in ethnic minority individuals in North East England should be seriously considered.

Apart from using social media, participants provided additional suggestions for increasing ethnic minority individuals' confidence in COVID-19 vaccination. One of these suggestions involved enlisting the help of community leaders. Our previous research on ethnic minority individuals in the general UK population yielded similar findings (Eberhardt et al. 2022), which suggests that this strategy should be considered as part of any attempts to increase the uptake of the vaccine among ethnic minority groups in North East England. Participants also suggested that educating hesitant individuals on the vaccine may improve uptake. Education has been suggested in previous research, specifically as part of efforts to combat conspiracy beliefs in relation to the vaccine (van Prooijen 2017). Furthermore, some of our participants appeared to be misinformed about the booster vaccination, suggesting that it was unnecessary to get vaccinated unless one was clinically vulnerable, or if case numbers rose. It is therefore important that ethnic minority individuals in North East England who are hesitant to get the booster vaccination (or the first and second dose) are made aware of the importance of COVID-19 vaccination.

## Strengths, limitations, and future directions

Our study presents an effort to provide an in-depth understanding of attitudes and perceptions of the COVID-19 booster vaccine underlying the decision to get vaccinated in minority ethnic individuals in North East England. These insights are key to developing successful campaigns and interventions to increase booster vaccine uptake in this population. Nevertheless, some limitations need to be acknowledged. Data saturation was reached during analysis, indicating an adequate sample size; furthermore, in thematic analysis, meaning is generated through interpretation, rather than excavated from data, therefore thematic analysis does not depend on sample size (Braun and Clarke 2019). Nevertheless, with the interviews conducted online, further research involving individuals who do not have internet access, and may therefore have lower levels of education and of health literacy (Bailey et al. 2015), is necessary. The shopping vouchers offered to participants as an incentive to participate in the interviews may potentially have affected their responses. However, interviewees often offered very critical responses, suggesting that social desirability is unlikely to have influenced the interview data.

Our findings are based on a sample of 16 individuals. In order to determine to what extent they reflect the attitudes and perceptions of minority ethnic individuals in North East England, larger-scale work needs to be undertaken, employing quantitative or mixed methods. The present findings should be used to inform the measures used in a larger-scale study. Such work should also establish the role of perceptions of the vaccine in the decision to get vaccinated for COVID-19, similar to our prior research which applied Protection Motivation Theory to predict individuals' intention to get vaccinated (Eberhardt et al. 2022). As such, although our study should be treated as exploratory, it offers valuable indications for areas that need to be explored further. Furthermore, it is important to note that some of the present findings, specifically those around medical mistrust, are particular to ethnicity and historical events involving racial discrimination, and are similar to prior research involving samples consisting solely of ethnic minority individuals (Sagoe et al. 2022; Charura et al. 2022; Magee et al. 2022; Eberhardt et al. 2022).

Based on our findings, we suggest exploring the following areas in relation to increasing COVID-19 vaccine confidence in ethnic minorities in North East England:

1. *Enlist community leaders in COVID-19 booster vaccination campaigns.* Participants suggested that community leaders could boost individuals' confidence in COVID-19 vaccination, in line with our previous research (Eberhardt et al. 2022) and as argued elsewhere (Islam et al. 2021). Community leaders may be best placed to pre-

sent information and respond to questions related to the importance of COVID-19 vaccinations, and to address myths around ethnicity-specific (in)vulnerability to COVID-19.

2. *Continue efforts to make vaccination as easy and as convenient as possible.* Participants reported practical barriers towards vaccination, in line with prior research (e.g., Eberhardt and Ling 2022a). COVID-19 booster programmes should continue working to remove any practical barriers (for example, eliminating the need to travel for long distances, or prolonged waiting times), such as having walk-in clinics where no appointment is necessary and, potentially, mobile vaccination units to further minimise the time and effort that needs to be invested in vaccination.
3. *Build trust in COVID-19 vaccination by presenting the research and development supporting the safety and effectiveness of the vaccine to individuals.* Participants suggested that minority ethnic communities' confidence in COVID-19 vaccination would be significantly increased if they could be convinced of the evidence base supporting the safety of the vaccine. Participants suggested that this should be undertaken by minority ethnic individuals who are involved in pharmaceutical or medical aspects of COVID-19 vaccination (e.g., those who have worked on the development of the vaccine). Whether this would be an effective strategy needs to be explored in further research.

## Conclusion

Our study provides an insight into factors associated with COVID-19 booster vaccine hesitancy in ethnic minorities in North East England. We found that a perceived (in)vulnerability to COVID-19, based on ethnicity, played a role in this hesitancy, reflecting the importance of perceived susceptibility in terms of PMT. Furthermore, barriers to COVID-19 booster vaccination existed in the form of time constraints and a perceived lack of practical support in the event of experiencing side-effects. These barriers can be framed as response costs in PMT. Additionally, and importantly, there was a lack of confidence in the vaccine, with individuals seeing it as lacking sufficient research (and therefore as unsafe), as well as medical mistrust due to historical events involving medical experimentation on minority ethnic individuals. We recommend involving community leaders in addressing people's concerns, misassumptions, and lack of confidence in COVID-19 vaccination, to help increase uptake among minority ethnic individuals.

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2nd author: conceptualisation, investigation, writing- reviewing and editing.

3rd author: conceptualisation, formal analysis, writing- reviewing and editing.

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**Data availability** Research data are not shared. Sample size and the nature of the topic results in possible identifiability of participants, therefore unable to share on ethical grounds.

## Declarations

**Ethics approval** The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Approval was granted by the Ethics Committee of the University of Sunderland.

**Consent for publication** The authors affirm that research participants provided informed consent for publication.

**Competing interests** The authors have no relevant financial or non-financial interests to disclose.

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