

COVID-19 vaccine hesitancy and the role of social media in ethnic minorities groups in the UK

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M.N. designed the study and drafted the manuscript. All authors reviewed the study and manuscript and provided critical comments on the draft. All authors contributed to the interpretation of review findings.

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Abstract

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COVID-19 vaccines have been developed and administered at record pace in order to curtail the impact of the COVID-19 pandemic. Vaccine hesitancy has impacted uptake unequally across different groups. This study explores the drivers for vaccine hesitancy in ethnic minority groups in the UK, the impact of social media on vaccine hesitancy and how vaccine hesitancy may be overcome. Twelve semi-structured interviews were conducted, coded and thematically analyzed with participants from ethnic minority groups in the UK who identified as vaccine hesitant.

Social media played a significant role in vaccine hesitancy. For those who considered themselves healthy, seeing misinformation of extreme side effects relating to COVID-19 vaccinations on social media resulted in the opinion that the risk of vaccination is greater than risk from COVID-19 infection. For women, misinformation on social media regarding fertility was a reason for delaying or not getting vaccinated. Access and trust of sources of information outside of social media increased likelihood of vaccination.

This study identified the broad spectrum of views on vaccine hesitancy in ethnic minority groups in the UK. Enabling factors such as a desire to travel, and positive public health messaging can increase vaccine uptake, whereas a lack of trusted sources of information may cause vaccine hesitancy. Further research is required to combat misinformation and conspiracy theories. Effective methods include actively responding and disproving the misinformation. For an inclusive vaccination programme that reduces health inequality, policy makers should build trust amongst marginalized communities and address their concerns through tailored public health messaging.

Contribution to the field

Vaccine hesitancy has impacted COVID-19 vaccine uptake unequally across different groups. This qualitative study explores drivers for vaccine hesitancy in ethnic minority groups in the UK, the impact of social media on vaccine hesitancy and how vaccine hesitancy may be overcome. Twelve interviews were conducted, coded and thematically analysed, with participants from ethnic minority groups in the UK who identified as vaccine hesitant. This study demonstrates that vaccine hesitancy amongst ethnic minorities is a broad spectrum of views. Misconceptions were identified regarding COVID-19 vaccinations which need to be addressed or continue to be tackled by governing bodies, academics and public health officials to restore confidence in vaccines, specifically; long term side effects, extreme side effects and vaccine ingredients, and fertility. The dismissal of vaccination concerns from mainstream discourse and lack of consideration for further transparency, accurate media and social media reporting, and a perceived lack of trusted sources of information appear to increase vaccine hesitancy. Further works needs to be done towards combatting misinformation and conspiracy theories, where the deletion and censorship of such information appears to exacerbate vaccine scepticism, but where actively responding and then disproving the misinformation appears to be more convincing.

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In review

Understanding COVID-19 vaccine hesitancy in ethnic minorities groups in the UK

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8 **Abstract**

9 COVID-19 vaccines have been developed and administered at record pace in order to curtail the
10 impact of the COVID-19 pandemic. Vaccine hesitancy has impacted uptake unequally across
11 different groups. This study explores the drivers for vaccine hesitancy in ethnic minority groups in
12 the UK, the impact of social media on vaccine hesitancy and how vaccine hesitancy may be
13 overcome.

14 Twelve semi-structured interviews were conducted, coded and thematically analyzed with
15 participants from ethnic minority groups in the UK who identified as vaccine hesitant.

16 Social media played a significant role in vaccine hesitancy. For those who considered themselves
17 healthy, seeing misinformation of extreme side effects relating to COVID-19 vaccinations on social
18 media resulted in the opinion that the risk of vaccination is greater than risk from COVID-19
19 infection. For women, misinformation on social media regarding fertility was a reason for delaying or
20 not getting vaccinated. Participants who had sources of information they trusted in outside of social
21 media were more likely to choose to get vaccinated.

22 This study identified the broad spectrum of views on vaccine hesitancy in ethnic minority groups in
23 the UK. Enabling factors such as a desire to travel, and positive public health messaging can increase
24 vaccine uptake, whereas a lack of trusted sources of information may cause vaccine hesitancy.
25 Further research is required to combat misinformation and conspiracy theories. Effective methods
26 include actively responding and disproving the misinformation. For an inclusive vaccination
27 programme that reduces health inequality, policy makers should build trust amongst marginalized
28 communities and address their concerns through tailored public health messaging.

29 **1 Introduction**

30 Vaccinations are one of public health' most effective interventions, and have intersecting individual
31 and societal benefits (1). As the COVID-19 pandemic has developed, many factors impacting vaccine
32 uptake have come into play, such as distrust in governments (2) widespread misinformation

33 regarding COVID-19 and concerns about the safety of vaccines due to the fast development and
34 deployment speed (3).

35 Vaccine hesitancy presents a significant challenge to global public health (4) and COVID-19 has
36 further amplified the importance of vaccine uptake. The Strategic Advisory group of Experts (SAGE)
37 In the UK, defined vaccine hesitancy as “delay in acceptance or refusal of vaccination despite
38 availability of vaccination services”. Vaccine hesitancy is complex and context specific, with a wide
39 range of social and physical variables. It is influenced by factors such as complacency, convenience
40 and confidence” (5).

41 The success of vaccination programmes depends on where, how and what information regarding the
42 safety, efficacy and access of vaccinations is communicated (6). There is an association between anti-
43 vaccination beliefs, conspiracy theories, reduced trust in institutions and an increased reliance on
44 social media for information on health (7). A survey of 1,476 UK adults found that users of
45 YouTube, Instagram, Snapchat, and TikTok are all less likely to express willingness for vaccination
46 against COVID-19 (7). Examples of misinformation on social media includes links between the 5G
47 mobile network and COVID-19, and the theory that the pandemic is a bioweapon or conspiracy (8).
48 Recent systematic review of vaccines hesitancy and social media interventions illustrated a major gap
49 and lack of robust evaluation results (2). As social media grows exponentially, the anti-vax
50 movement is also expected to spread further across the multitude of platforms. The term anti-vaxxers
51 can be defined as “someone who believes vaccines do not work, are not safe or refuse vaccines for
52 themselves and their children if applicable” (9) and should not be used interchangeably with vaccine
53 hesitancy.

54 In the UK, while surveys show over 90% of adults express positive sentiments towards the vaccine
55 (10), when looking at ethnic minorities specifically, vaccine hesitancy increases substantially. A
56 December 2020 survey of 12,035 participants showed the highest vaccine hesitancy in Black
57 (71.8%), followed by Pakistani/Bangladeshi (42.4%) and Mixed (32.4%) ethnicity people. With
58 15.6% of White British or Irish groups showing vaccine hesitancy (11). A 2020 report from Public
59 Health England showed that after accounting for the impact of age, region and deprivation and
60 gender, people of ethnic minorities including Indian, Chinese, Black had between 10 to 50% higher
61 risk of mortality from COVID-19, compared to people who were White British (12).

62 The study aims to build on existing research by undertaking semi-structured interviews with a
63 convenience sample of people from ethnic minority groups who have expressed concerns regarding
64 the Covid-19 vaccines. The following research questions were explored in this study; 1) What are the
65 primary reasons for vaccine hesitancy in ethnic minority groups in the UK? 2) How does social media
66 impact vaccine uptake in ethnic minority groups in the UK? 3) What enables people from ethnic
67 minorities to overcome vaccine hesitancy? The next section, *Methodology*, details the study design,
68 data collection and analysis. This is followed by *Results* which comprises the key findings from the
69 coded interview transcripts. The themes identified in *Results* will then be reviewed and analyzed in
70 *Discussion and Conclusions*.

71

72 **2 Methodology**

73 **2.1 Study Design**

74 A qualitative study, comprising of twelve semi-structured interviews to identify reasons for vaccine
75 hesitancy, the primary factors that impact vaccine hesitancy and vaccine uptake, and the role of social
76 media in vaccine hesitancy in ethnic minority communities. Developing the interview questions was
77 an iterative process, and began with five questions based on the Health Belief Model, which evolved
78 into a decision tree. The Health Belief Model (HBM) is a widely used theory in understanding and
79 predicting health behaviour, and comprises of five central components, which are impacted by
80 demographic variables and psychological characteristics, as can be seen in figure 4 (13). Studies have
81 demonstrated that interventions targeting the HBM constructs can improve vaccine uptake (14), hence
82 the HBM model components have been integrated into the study interview questions. Pilot interviews
83 which tested the relevance and usefulness of the interview questions against the research aims were
84 also utilised. Due to COVID-19, the interviews were undertaken online on video conference platform
85 Microsoft teams. The interviews were recorded and transcribed verbatim by the interviewer and were
86 conducted entirely in English.

87 **2.2 Recruitment of participants**

88 Participants were invited to take part in the study based on the following inclusion criteria; over 18
89 years old, living in the UK, identified as part of an ethnic minority group, and have or have had
90 concerns regarding vaccinating against COVID-19. In this study, the term 'ethnic minorities' refers to
91 all ethnic groups except the white British group. The interviews were carried out between July and
92 August, 2021. People who identified themselves as vaccine hesitant, but have taken the COVID-19
93 vaccine, were included within the study to explore how and why some are able to overcome their
94 vaccine hesitancy. The participants were recruited by snowball sampling. The interviews were
95 confidential to encourage open and honest answers and increase participant comfort.

96 **2.3 Analysis plan**

97 Conventional content analysis (15), in which coding categories are derived directly from the text, was
98 used to code the semi-structured interview transcripts. The Framework method was next used to
99 organize and chart the coded, which comprised of six stages. - familiarization, coding (using NVIVO
100 12, a Qualitative Data Analysis software), designing a thematic framework, indexing and charting. In
101 the final stage - mapping and interpretation - the characteristics of the charted data were analyzed to
102 review the primary themes and topics from the coded data. These themes were then used to identify
103 gaps in the existing literature, providing theoretical triangulation and informing scope for future
104 studies (16).

105 **2.4 Background of the participants**

106 Out of twelve participants, five had received one or both vaccinations against COVID-19 while seven
107 participants had chosen not to be vaccinated against COVID-19. All participants resided in the UK at
108 the time of interview. Seven participants identified as female and five identified as male. The groups
109 represented by the participants were Black, Arab and Asian backgrounds; which included Indian,
110 Pakistani and Asian Other.

111 **3 Results**

112 The coding of the twelve interview transcripts was conducted in several steps. First, the interview
113 transcripts were first coded line by line, under nodes such as 'Choice', 'Infertility' and 'Sceptical' to
114 develop an understanding of the answers. The nodes were then organized in terms of the interview

115 questions, under categories such as ‘Information and Misinformation’ and ‘Vaccine Concerns’.
116 Following this, key themes including ‘Research’ and ‘Confusion and Uncertainty’ identified in the
117 transcripts were organized and coded.

118 **3.1 Reasons for vaccine hesitancy**

119 The reasons cited in the interviews for vaccine hesitancy can be seen in Figure 1. The numbers refer to
120 the number of interviews that the reasons were cited in. General and long term side effects and speed
121 of development of the COVID-19 vaccinations were the most common reasons, followed by the ‘belief
122 in your own immune system’ and concerns regarding the ingredients in the COVID-19 vaccine.
123

124 Figure 1: Reasons for Vaccine Hesitancy

125
126 Five of the twelve participants cited both side effects and long term side effects as concerns, while two
127 of the twelve participants cited side effects generally, and a further two participants cited long term
128 side effects specifically as concerns.

129 - *“In the long term, I am thinking what is the point of putting a dormant version of the virus
130 in me that could cause more complications down the line, because my body seems to be
131 fighting COVID-19 fine at the moment.”* Transcript 2 (male, not vaccinated)

132 - *“One of my friends had a stroke after the vaccine, and they said it wasn’t because of the
133 vaccine. I feel like there is something that they are not telling us, I think it’s a global thing,
134 not specifically the UK government, I am suspicious.”* Transcript 4 (female, not vaccinated)

135 Concerns regarding period irregularities, infertility and breastfeeding were recurring themes in three
136 interviews T1 (female, not vaccinated), T3 (female, not vaccinated), and T6 (female, vaccinated).
137 Infertility and period irregularities cited in T1, T3 and T6 and concerns due to breast feeding were
138 raised in T1 and T6.

139 Trust, confusion and uncertainty were themes that contributed towards vaccine hesitancy through many
140 interviews. When asked about key concerns regarding vaccines, Participant 1 (female, not vaccinated)
141 stated *“The information regarding vaccines has been very to and from i.e. this is good for them, this is
142 dangerous. I feel like it is my duty to take care of my son, I feel a bit uneasy with the breastmilk”*.

143 When asked about the sources of information that the participants have for vaccine related content,
144 many said they do not trust the official sources or are confused. This can be seen in Transcript 3
145 (female, not vaccinated), which states *“I think it is very confusing. The things they have on official
146 websites, social media talks about it, and you don’t know what to trust”*. This is from a Participant who
147 appeared to lose trust in official sources of information due to the content seen on social media. Trust
148 appears to be placed in people the participant knows, as the Participant also states *“I would go to some
149 sort of official website or maybe my uncle. I think the main thing is trusting someone who has more
150 knowledge of this than me”*.

151 Trust in medical professionals such as General Practitioners (GP) was an influencing factor in the
152 vaccine uptake decision making process. This can be seen in the case of Participant 4 (female, not
153 vaccinated) and Participant 9 (male, vaccinated). Both participants had concerns regarding their
154 allergies presenting side effects if they took the COVID-19 vaccine. Participant 9 called their GP
155 practice and booked an appointment with a nurse who confirmed the vaccine was safe to take, following
156 which the Participant decided to get vaccinated.

157 Participant 4 did not consult their GP regarding their concerns, and did not get vaccinated, explaining,
158 *“I once went to see the GP because I had some spots on my back, and I was prescribed steroids, and*
159 *it made the problem worse and I still have the spots now. That makes me think they don’t know me and*
160 *at my age I know my body and what I react to”*. This suggests that previous negative experiences have
161 led to a loss of trust, which may have left the Participant vulnerable to seeking unofficial advice.

162 **3.2 Social Media Impact On Vaccine Hesitancy**

163 Most participants said they received messages on social media regarding COVID-19 vaccines, with
164 the contents being both anti-vaccination and pro-vaccination. The messaging generally happened
165 through WhatsApp, with links to social media content on platforms such as Instagram and YouTube.
166 Some participants said they were impacted by these messages, whilst others said they were not affected.
167 Impacting factors are not always clear; even if a participant is impacted by social media, they may not
168 recognise this. This can be seen in Transcript 11 (male, not vaccinated). When asked about impact of
169 social media on vaccine hesitancy, the answer was *“not at all”* and *“I don’t feel peer pressure from*
170 *either side, to do it or not to do it”* yet the Participant goes on to say *“You see stories on social media*
171 *about rare blood clotting or rare immune systems. Those stories are very off-putting, because then you*
172 *see that there is a risk factor to the COVID-19 vaccines”*.

173 The participants discussed receiving anti-vaccination content concerning topics of extreme side effects
174 such as blood clots, inflammation and negative effects on the immune systems. Participants also cited
175 ‘conspiracy theories’, including the idea that COVID-19 is not real and microchips were used in
176 vaccines for tracking purposes. While some participants found these theories to be exaggerated,
177 scaremongering or false, others thought there was some truth in them. The official messaging around
178 the COVID-19 vaccinations also elicited various responses from the participants, including feeling
179 suspicious, pressurized to take the vaccine, guilty for not taking the vaccine or finding the volume of
180 advertising of the vaccine frightening. The removal of anti-vaccination content from social media
181 platforms can also add suspicion, as Participant 4 (female, not vaccinated) states *“I go on YouTube,*
182 *there are some very clever people, some scientists, who are speaking against the vaccinations, but they*
183 *get banned. That makes you think why are they doing this? Let us make up our mind. I mean everyone*
184 *is responsible”*.

185 **3.3 Overcoming Vaccine Hesitancy**

186 Figure 2 shows reasons that motivated the participants to get vaccinated against COVID-19. Several
187 suggested they know or suspect that they have had COVID-19. For Participants T2 (male, not
188 vaccinated) and T3 (female, not vaccinated), this was one of the reasons to not vaccinate, while for
189 Participant T5 (female, vaccinated), having had COVID-19 has not been a deterrent, as should they get
190 infected again, they expect to get a milder symptoms.

191 Figure 2: Motivations for having received the COVID-19 Vaccine

192 An influencing factor in choosing to get vaccinated against COVID-19 also appears to be having close
193 connections with healthcare professionals. This is most evident in T7 (female, vaccinated), which
194 states; “My dad is a doctor and he is always talking about vaccines, so I kind of knew that I should get
195 vaccines.”

196 Figure 3: Motivations for potentially receiving the COVID-19 Vaccine

197 Figure 3 shows the reasons that participants who have not already received the COVID-19 vaccination
198 may get vaccinated. Of the seven participants who have not been vaccinated, four said that they may
199 take the vaccine if not being vaccinated would hinder travel. The general themes were a need for further
200 clarification or certainty regarding the ingredients in the vaccine, general concerns about side effects,
201 and specific side effects especially with regards to fertility. Participant 1 (female, not vaccinated) said
202 that they may consider taking the vaccine once they have stopped breastfeeding, as side effects to her
203 child would be a major concern.

204 3.4 Health Belief Model

205 Considering the categories in the Health Belief Model (13) (figure 4), the *perceived susceptibility* of
206 COVID-19 amongst the participants who have not been vaccinated appears to be low. The following
207 reasons were provided during interview: wearing appropriate PPE, not using public transport and
208 limiting interactions with large groups. The *perceived severity* of COVID-19 is also low among the
209 participants who have not been vaccinated, as some have recovered from Covid-19 and feel they have
210 developed an understanding of the risks, while others feel their immune system will be protective.
211 Meanwhile the *perceived barriers* to getting a COVID-19 vaccine appear to stem largely from
212 misinformation on social media and lack of access, understanding or trust of authentic sources of
213 information regarding the vaccines. This lack of trust extends to the government and institutions for
214 some participants.

215 Figure 4: Health Belief Model from (13)

216 A *perceived benefit* is the ability to travel. The *health motivation* in general appears to be low in both
217 the participants who did get the vaccination against COVID-19 and those who didn't. A reason for this
218 may be that the majority of the participants perceived the risk of extreme side effects from the
219 vaccination to be high. Generally, the participants who chose to get vaccinated considered that the risk
220 from COVID-19 was greater than the risk from highly adverse side effects of the vaccine, while the
221 participants who did not get vaccinated believed the opposite. Examples of a *cue to action* in
222 overcoming vaccine hesitancy for some participants has been friends and families, further reading on
223 websites such as The World Health Organization or simply discussing their concerns with their General
224 Practitioner.

225 4 Discussion

226 4.1 Reasons for vaccine hesitancy

227 An BMJ study examining why ethnic minority groups are COVID-19 vaccine hesitant based on data
228 from large scale surveys identified that long term side effects and a lack of trust were the primary
229 reasons (17). A Lancet study highlighted similar themes with the addition of risk of deportation when
230 registering for vaccinations and infertility (18). Fertility has been cited elsewhere as a reason for
231 COVID-19 vaccine hesitancy; for example, in a Bradford based study where twenty participants were

232 interviewed, one participant stated infertility as a reason for not taking the vaccine (19). When
233 considering Covid-19 vaccine hesitancy in general in the UK, a nationally representative survey
234 showed the following common reasons for refusal; being against vaccinations, concerns regarding the
235 safety of the vaccines, considering that COVID-19 was harmless and lack of trust generally (20).

236 In this study, ethnic minorities were specifically investigated, and infertility was found to be a prevalent
237 theme. Including both vaccinated and non-vaccinated participants in the study enabled the
238 understanding of the broad spectrum of infertility related vaccine hesitancy amongst women, which
239 extended to concerns regarding period irregularities and breastfeeding. To clarify the misconception
240 and misinformation around fertility and COVID-19 vaccinations a study was conducted which
241 demonstrated that the Pfizer-BioNTech's vaccination against COVID-19 has no negative effect on a
242 women's fertility (21).

243 When asked about COVID-19 vaccine type preference, almost all participants said Pfizer was preferred
244 over Astra Zeneca, or Moderna. The participants cited reasons such as the Pfizer vaccine having greater
245 efficacy, concerns regarding risk of blood clots from the Astra Zeneca vaccine and hearing from friends
246 and family that Pfizer has milder side effects. COVID-19 vaccinations and their side effects continue
247 to receive extensive media coverage and this may not have been helped by mixed messages from
248 government bodies. In early March 2021, several European countries paused the use of Oxford-
249 AstraZeneca vaccination against COVID-19, due to some reports of thromboembolic events with fatal
250 outcomes amongst those who had been vaccinated (22). The European Medicines Agency reviewed
251 these events and announced that despite possible link to rare blood clots, the benefits of this vaccination
252 outweigh the risks, following which many countries reinstated their vaccine programs (23), however
253 these concerns persisted amongst participants in our study. Recently, a Spanish cohort study found that
254 rates of thromboembolic events in people who received the Pfizer vaccine were no different to those
255 who received the Astra Zeneca vaccine, though this paper has not yet been peer-reviewed (24).

256 **4.2 Social Media Impact On Vaccine Hesitancy**

257 Social media played a role in contributing towards vaccine hesitancy. For some, particularly those who
258 felt healthy, seeing misinformation of extreme side effects relating to the COVID-19 vaccinations on
259 social media gave the idea that the risk of vaccination is greater than the risk of COVID-19.
260 Misinformation on social media regarding fertility became a reason for delaying or not getting
261 vaccinated. The concerns appear to be further solidified when discussed with friends and families who
262 may have seen similar content on social media, subject to social media echo chambers. Monitoring
263 and removing misinformation from social media platforms has been a solution. However, some
264 participants have shared that this leads them to believe that the government has something to hide.

265 Better understanding how and who spreads misinformation through social media networks is the key
266 to take action, (25) with more research required to analyze and visualize this information in real time
267 (26). As people receive misinformation on social media and are adversely influenced (7), it becomes
268 crucial that they have access to trusted sources of information. Rebuilding of trust must be achieved
269 over time and can start with key points of contact such as local health care providers and community
270 leaders. For instance, many participants did not think they could discuss their concerns regarding
271 vaccinations with their General Practitioner.

272 This study identified that there is need for further work to be done towards combatting misinformation
273 and conspiracy theories, which can be resolved by social media companies take responsibility for

274 deleting such content from social media, but also by actively responding and then disproving the
275 misinformation.

276 **4.3 Overcoming Vaccine Hesitancy**

277 A factor in choosing to get vaccinated was access and trust of sources of information outside of social
278 media and news outlets. Participants who knew medical professionals or were trusting of their GP or
279 the NHS website appeared more likely to get vaccinated, despite concerns.

280 Ahead of the launch of the vaccine programme in the UK, studies conducted to predict groups that may
281 be vaccine hesitant identified high vaccine hesitancy amongst ethnic minority communities (11),
282 leading to medical specialists calling for ethnic minorities communities to be considered a priority for
283 vaccination (27). which has not happened (28).

284 **4.4 Implications for policy and practice**

285 This study demonstrates that vaccine hesitancy amongst ethnic minorities is a broad spectrum of views,
286 with some participants choosing to get vaccinated against COVID-19 despite their concerns, some
287 waiting for further information or benefit whilst others choosing not to get vaccinated. The results
288 identified many misconceptions regarding COVID-19 vaccinations which need to be addressed or
289 continue to be tackled by governing bodies, academics and public health officials to restore confidence
290 in vaccines, specifically; long term side effects, extreme side effects, vaccine ingredients and fertility.

291 While this study focuses on vaccine hesitancy in ethnic minority communities, it is important to also
292 consider that linking ethnic minority communities with vaccine hesitancy can result in the incorrect
293 framing of the issue. The link can suggest mistakenly that ethnic minorities are to blame for being
294 vaccine hesitant, rather than focusing on the need for public health systems to be more accessible to all
295 (18).

296 The reality of the issue is multidimensional with many structural barriers at play. A UK study found
297 that when approaching the police and other local services, twice as many Asian and Black respondents
298 faced discrimination when compared to the White respondents. This study also showed an association
299 with experiences of discrimination and low vaccine uptake (29). Minority groups have also been
300 historically exploited in medical experiments such as the abusive US Tuskegee syphilis study (30).
301 Unfortunately some exploitation continues; for example, a study used experimental drugs on Nigerian
302 children without consent from their parents, a clear ethical violation (31), further giving rise to mistrust.

303 It is crucial that vaccine hesitancy is not grouped with anti-vaxxers; this study demonstrates that
304 vaccine hesitancy has a temporality, and can be overcome. The solution does not appear to be as simple
305 as translating vaccine information into multiple languages, but rather involves getting to the core of
306 the issue of mistrust and misinformation, and developing long term, sustainable relationships.
307 Improving vaccine uptake in this way would not only support communities who have been
308 disproportionately impacted by COVID-19 but would also improve immunity in the wider population
309 (18).

310 The balance of research on vaccine efficacy, safety and hesitancy is primarily focused on western and
311 white populations (32) (33). As a result, public health policy-making and communications may be
312 biased towards these groups. Further research on all aspects of vaccinations for non-white ethnicities
313 –the vast majority of the world’s population – is needed to redress these structural imbalances.

314 **4.5 Strengths and limitations**

315 The interview structure and open ended nature of the questions allowed participants to discuss in the
316 topic in as much detail as they are comfortable with while continuing to develop their answers and
317 thought process. The final question where participants were asked if there is anything further they
318 would like to add provided scope for further points that the participant may have thought of during the
319 interview. A key strength of this study, setting it aside from similar research, was to include participants
320 who had been vaccinated as well as those who were not which allowed for identification of ways
321 vaccine hesitancy may be overcome.

322 Utilising established methods of qualitative analysis revealed key themes that can be further explored.
323 Creating a de novo framework reduced structural bias of having to fit reasons for vaccine hesitancy
324 into frameworks designed for other groups. While the answers provided by the participants may be
325 representative of some ethnic minority communities, the answers and reasonings for vaccine hesitancy
326 provided in the interviews may not be exclusive to ethnic minority communities. A larger sample size
327 may allow for a greater number of ethnic minorities communities to be included in the study. While
328 the diversity of the sample was wide, it did not fully represent all ethnic minorities, for instance, none
329 of the participants came from a Chinese background. In future studies interpreters may also be allowed
330 for, to include non-English speaking participants.

331 **5 Conclusion**

332 This study identified the broad spectrum of views regarding vaccine hesitancy in ethnic minority
333 groups in the UK, and established that vaccine hesitancy may be overcome to varying degrees. Long
334 term side effects as well as side effects in general were the main concerns amongst the twelve
335 participants. Social media plays a role in contributing towards vaccine hesitancy. For some, particularly
336 those who felt healthy, seeing misinformation of extreme side effects relating to the Covid-19
337 vaccinations on social media resulted in the opinion that the risk of vaccination is greater than the risk
338 of Covid-19. For women, misinformation on social media regarding fertility became a reason for
339 delaying or not getting vaccinated. A factor in choosing to get vaccinated was access and trust of
340 sources of information outside of social media and news outlets. Participants who knew medical
341 professionals or were trusting of their GP or the NHS website appeared more likely to get vaccinated,
342 despite concerns.

343 Developing and building trust amongst ethnic minorities is often seen as a problem within that
344 community rather than a problem with the public health messaging and approach. Further studies are
345 required to better understand the root causes of the lack of trust government organisations and
346 institutions. The dismissal of vaccination concerns from mainstream discourse and lack of
347 consideration for further transparency, accurate media and social media reporting, and a perceived lack
348 of trusted sources of information appear to increase vaccine hesitancy. Concerted efforts are required
349 to create a truly inclusive vaccination programme. One that does not align with the in-built structural
350 inequalities within our society and healthcare system.

351 **6 References**

- 352 1. Dubé E, MacDonald NE. How can a global pandemic affect vaccine hesitancy?
353 <https://doi.org/10.1080/14760584.2020.1825944> [Internet]. 2020 [cited 2021 Jul 8];19(10):899–
354 901. Available from: <https://www.tandfonline.com/doi/abs/10.1080/14760584.2020.1825944>

COVID-19 vaccine hesitancy and the role of social media in ethnic minorities groups in the UK

- 355 2. Li L, Wood CE, Kostkova P. Vaccine hesitancy and behavior change theory-based social
356 media interventions: a systematic review. *Transl Behav Med* [Internet]. 2021 Nov 29 [cited
357 2022 Feb 12]; Available from: [https://academic.oup.com/tbm/advance-](https://academic.oup.com/tbm/advance-article/doi/10.1093/tbm/ibab148/6445967)
358 [article/doi/10.1093/tbm/ibab148/6445967](https://academic.oup.com/tbm/advance-article/doi/10.1093/tbm/ibab148/6445967)
- 359 3. Robinson E, Jones A, Lesser I, Daly M. International estimates of intended uptake and refusal
360 of COVID-19 vaccines: A rapid systematic review and meta-analysis of large nationally
361 representative samples. *Vol. 39, Vaccine*. 2021.
- 362 4. WHO. Vaccination: European Commission and World Health Organization join forces to
363 promote the benefits of vaccines [Internet]. World Health organization. 2019 [cited 2021 Jul
364 8]. Available from: [https://www.who.int/news/item/12-09-2019-vaccination-european-](https://www.who.int/news/item/12-09-2019-vaccination-european-commission-and-world-health-organization-join-forces-to-promote-the-benefits-of-vaccines)
365 [commission-and-world-health-organization-join-forces-to-promote-the-benefits-of-vaccines](https://www.who.int/news/item/12-09-2019-vaccination-european-commission-and-world-health-organization-join-forces-to-promote-the-benefits-of-vaccines)
- 366 5. MacDonald NE, Eskola J, Liang X, Chaudhuri M, Dube E, Gellin B, et al. Vaccine hesitancy:
367 Definition, scope and determinants. *Vaccine*. 2015 Aug 14;33(34):4161–4.
- 368 6. Chadwick A, Kaiser J, Vaccari C, Freeman D, Lambe S, Loe BS, et al. Online Social
369 Endorsement and Covid-19 Vaccine Hesitancy in the United Kingdom:
370 <https://doi.org/10.1177/20563051211008817> [Internet]. 2021 Apr 5 [cited 2021 Jul 9];7(2).
371 Available from: <https://journals.sagepub.com/doi/full/10.1177/20563051211008817>
- 372 7. Jennings W, Stoker G, Bunting H, Valgarðsson VO, Gaskell J, Devine D, et al. Lack of Trust,
373 Conspiracy Beliefs, and Social Media Use Predict COVID-19 Vaccine Hesitancy. *Vaccines*
374 2021, Vol 9, Page 593 [Internet]. 2021 Jun 3 [cited 2021 Jul 26];9(6):593. Available from:
375 <https://www.mdpi.com/2076-393X/9/6/593/htm>
- 376 8. Loomba S, Figueiredo A de, Piatek SJ, Graaf K de, Larson HJ. Measuring the impact of
377 COVID-19 vaccine misinformation on vaccination intent in the UK and USA. *Nat Hum Behav*
378 2021 53 [Internet]. 2021 Feb 5 [cited 2021 Jul 15];5(3):337–48. Available from:
379 <https://www.nature.com/articles/s41562-021-01056-1>
- 380 9. Benoit SL, Mauldin RF. The “anti-vax” movement: a quantitative report on vaccine beliefs
381 and knowledge across social media. *BMC Public Health* [Internet]. 2021 Dec 1 [cited 2022
382 May 23];21(1):1–11. Available from:
383 <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12114-8>
- 384 10. Office for National Statistics. Coronavirus and the social impacts on Great Britain [Internet].
385 2021 [cited 2021 Aug 12]. Available from:
386 [https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbe-](https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesocialimpactsongreatbritain/19february2021)
387 [ing/bulletins/coronavirusandthesocialimpactsongreatbritain/19february2021](https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/bulletins/coronavirusandthesocialimpactsongreatbritain/19february2021)
- 388 11. Robertson E, Reeve KS, Niedzwiedz CL, Moore J, Blake M, Green M, et al. Predictors of
389 COVID-19 vaccine hesitancy in the UK household longitudinal study. *Brain Behav Immun*.
390 2021;94.
- 391 12. Public Health England. Disparities in the risk and outcomes of COVID-19. 2020 [cited 2021
392 Aug 12]; Available from:
393 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/f](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf)
394 [ile/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf)

- 395 13. Abraham C, Sheeran P. Predicting and changing health behaviour Research and Practice with
396 Social Cognition Models. In: McGraw-Hill Education. 2015.
- 397 14. Wong LP, Alias H, Wong P-F, Lee HY, AbuBakar S. The use of the health belief model to
398 assess predictors of intent to receive the COVID-19 vaccine and willingness to pay.
399 <https://doi.org/10.1080/2164551520201790279> [Internet]. 2020 Sep 1 [cited 2021 Aug
400 14];16(9):2204–14. Available from:
401 <https://www.tandfonline.com/doi/abs/10.1080/21645515.2020.1790279>
- 402 15. Hsieh H-F, Shannon SE. Three Approaches to Qualitative Content Analysis:
403 <http://dx.doi.org/10.1177/1049732305276687> [Internet]. 2016 Jul 1 [cited 2021 Aug
404 15];15(9):1277–88. Available from:
405 <https://journals.sagepub.com/doi/abs/10.1177/1049732305276687?journalCode=qhra>
- 406 16. Srivastava A, Thomson SB. Framework Analysis: A Qualitative Methodology for. *Appl Policy*
407 *Res JOAAG*. 2009;4(2).
- 408 17. Razai MS, Osama T, McKechnie DGJ, Majeed A. Covid-19 vaccine hesitancy among ethnic
409 minority groups. *BMJ* [Internet]. 2021 Feb 26 [cited 2021 Aug 26];372. Available from:
410 <https://www.bmj.com/content/372/bmj.n513>
- 411 18. Kadambari S, Vanderslott S. Lessons about COVID-19 vaccine hesitancy among minority
412 ethnic people in the UK. *Lancet Infect Dis* [Internet]. 2021 Sep 1 [cited 2021 Aug
413 26];21(9):1204–6. Available from:
414 <https://linkinghub.elsevier.com/retrieve/pii/S1473309921004047>
- 415 19. Lockyer B, Islam S, Rahman A, Dickerson J, Pickett K, Sheldon T, et al. Understanding
416 COVID-19 misinformation and vaccine hesitancy in context: Findings from a qualitative study
417 involving citizens in Bradford, UK. *Heal Expect*. 2021;
- 418 20. Bullock J, Lane JE, Shults FLR. What causes COVID-19 vaccine hesitancy? Ignorance and
419 the lack of bliss in the United Kingdom. *Humanit Soc Sci Commun* 2022 91 [Internet]. 2022
420 Mar 17 [cited 2022 May 22];9(1):1–7. Available from:
421 <https://www.nature.com/articles/s41599-022-01092-w>
- 422 21. Safrai M, Rottenstreich A, Herzberg S, Imbar T, Reubinoff B, Ben-Meir A. Stopping the
423 misinformation: BNT162b2 COVID-19 vaccine has no negative effect on women’s fertility.
424 *medRxiv* [Internet]. 2021 Jun 1 [cited 2021 Aug 26];2021.05.30.21258079. Available from:
425 <https://www.medrxiv.org/content/10.1101/2021.05.30.21258079v1>
- 426 22. Wise J. Covid-19: European countries suspend use of Oxford-AstraZeneca vaccine after
427 reports of blood clots. *BMJ* [Internet]. 2021 Mar 11 [cited 2022 Feb 13];372:n699. Available
428 from: <https://pubmed.ncbi.nlm.nih.gov/33707182/>
- 429 23. Med D, Sønderskov KM, Dinesen PT, Dinesen Østergaard S. DANISH MEDICAL
430 JOURNAL Sustained COVID-19 vaccine willingness after safety concerns over the Oxford-
431 AstraZeneca vaccine. *Orig Artic Dan Med J*. 2021;68(5):3210292.
- 432 24. Burn E, Roel E, Pistillo A, Fernandez-Bertolín S, Aragón M, Reyes C, et al. Thromboembolic
433 Events and Thrombosis With Thrombocytopenia After COVID-19 Infection and Vaccination
434 in Catalonia, Spain. *SSRN Electron J* [Internet]. 2021 Jul 22 [cited 2021 Aug 27]; Available

- 435 from: <https://papers.ssrn.com/abstract=3886421>
- 436 25. Kostkova P, Mano V, Larson HJ, Schulz WS. Who is spreading rumours about vaccines?
437 Influential user impact modelling in social networks. *ACM Int Conf Proceeding Ser.* 2017 Jul
438 2;Part F128634:48–52.
- 439 26. Kostkova P, Mano V, Larson HJ, Schulz WS. VAC Medi+board: Analyzing vaccine rumours
440 in news and social media. *DH 2016 - Proc 2016 Digit Heal Conf.* 2016 Apr 11;163–4.
- 441 27. Hassan-Smith Z, Hanif W, Khunti K. Who should be prioritised for COVID-19 vaccines?
442 *Lancet* [Internet]. 2020 Nov 28 [cited 2022 May 22];396(10264):1732–3. Available from:
443 <http://www.thelancet.com/article/S0140673620322248/fulltext>
- 444 28. Hanif W, Ali SN, Patel K, Khunti K. Cultural competence in covid-19 vaccine rollout. *BMJ*
445 [Internet]. 2020 Dec 18 [cited 2021 Aug 26];371. Available from:
446 <https://www.bmj.com/content/371/bmj.m4845>
- 447 29. Royal Society of Arts M and C. Ethnic minorities twice as likely to face discrimination in
448 local services - RSA [Internet]. 2021 [cited 2021 Aug 26]. Available from:
449 [https://www.thersa.org/press/releases/2021/ethnic-minorities-twice-as-likely-to-face-](https://www.thersa.org/press/releases/2021/ethnic-minorities-twice-as-likely-to-face-discrimination-in-local-services)
450 [discrimination-in-local-services](https://www.thersa.org/press/releases/2021/ethnic-minorities-twice-as-likely-to-face-discrimination-in-local-services)
- 451 30. Centre for Disease Control and Prevention. Tuskegee Study - Timeline - CDC - NCHHSTP
452 [Internet]. 2021 [cited 2021 Aug 27]. Available from:
453 <https://www.cdc.gov/tuskegee/timeline.htm>
- 454 31. Lenzer J. Nigeria files criminal charges against Pfizer. *BMJ.* 2007;334.
- 455 32. Ekezie W, Czyznikowska BM, Rohit S, Harrison J, Miah N, Campbell-Morris P, et al. The
456 views of ethnic minority and vulnerable communities towards participation in COVID-19
457 vaccine trials. *J Public Health (Bangkok)* [Internet]. 2021 Jun 7 [cited 2021 Aug
458 27];43(2):e258–60. Available from:
459 <https://academic.oup.com/jpubhealth/article/43/2/e258/5942929>
- 460 33. Jackson L, Kuhlman C, Jackson F, Fox PK. Including Vulnerable Populations in the
461 Assessment of Data From Vulnerable Populations. *Front Big Data.* 2019 Jun 28;0:19.

462

463 **7 Contributor Statement**

464 M.N designed the study and drafted the manuscript. All authors reviewed the study and manuscript
465 and provided critical comments on the draft. All authors contributed to the interpretation of review
466 findings.

467 **8 Ethical Approval**

468 This study received ethical approval from the UCL Ethics Committee in July 2021, and was given the
469 Project ID 21185/00. The study was also registered with the UCL Data Protection Office, and is
470 registered under reference Z6364106/2021/07/135 social research in line with UCL's Data Protection
471 Policy.

472 **9 Conflict of Interest**

473 The authors declare that the research was conducted in the absence of any commercial or financial
474 relationships that could be construed as a potential conflict of interest.

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In review

Figure 1.JPEG

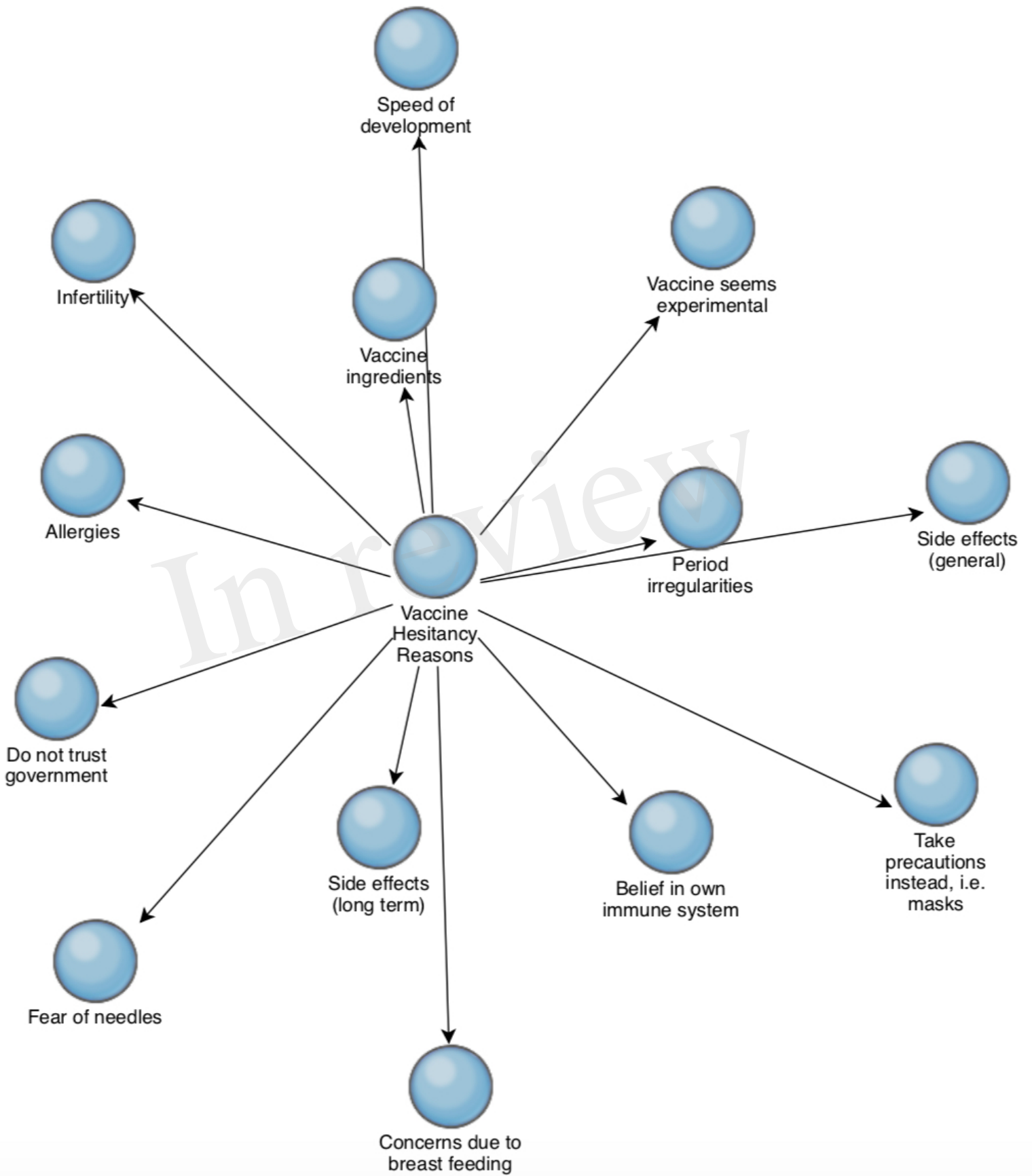


Figure 2.JPEG

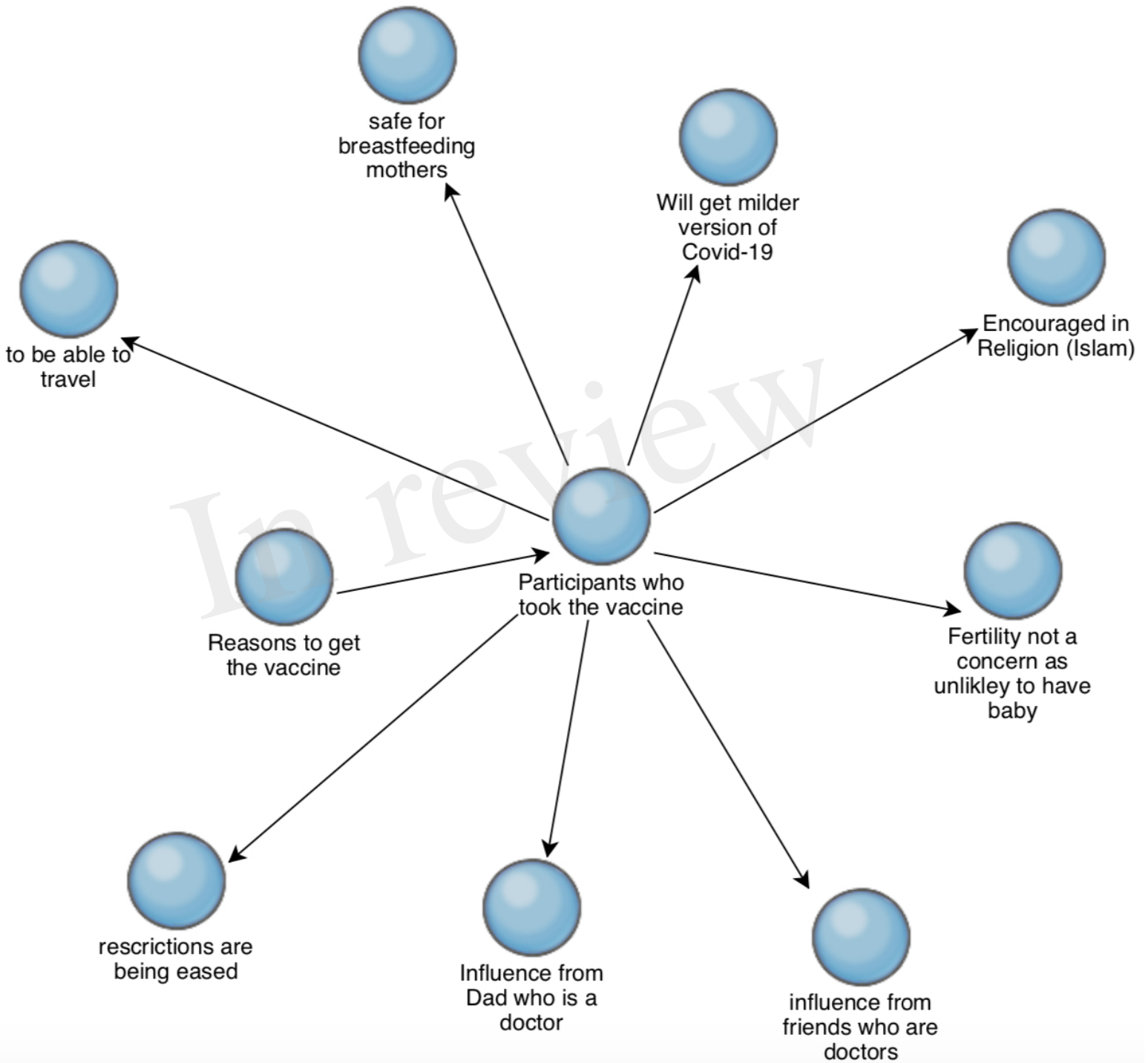


Figure 3.JPEG

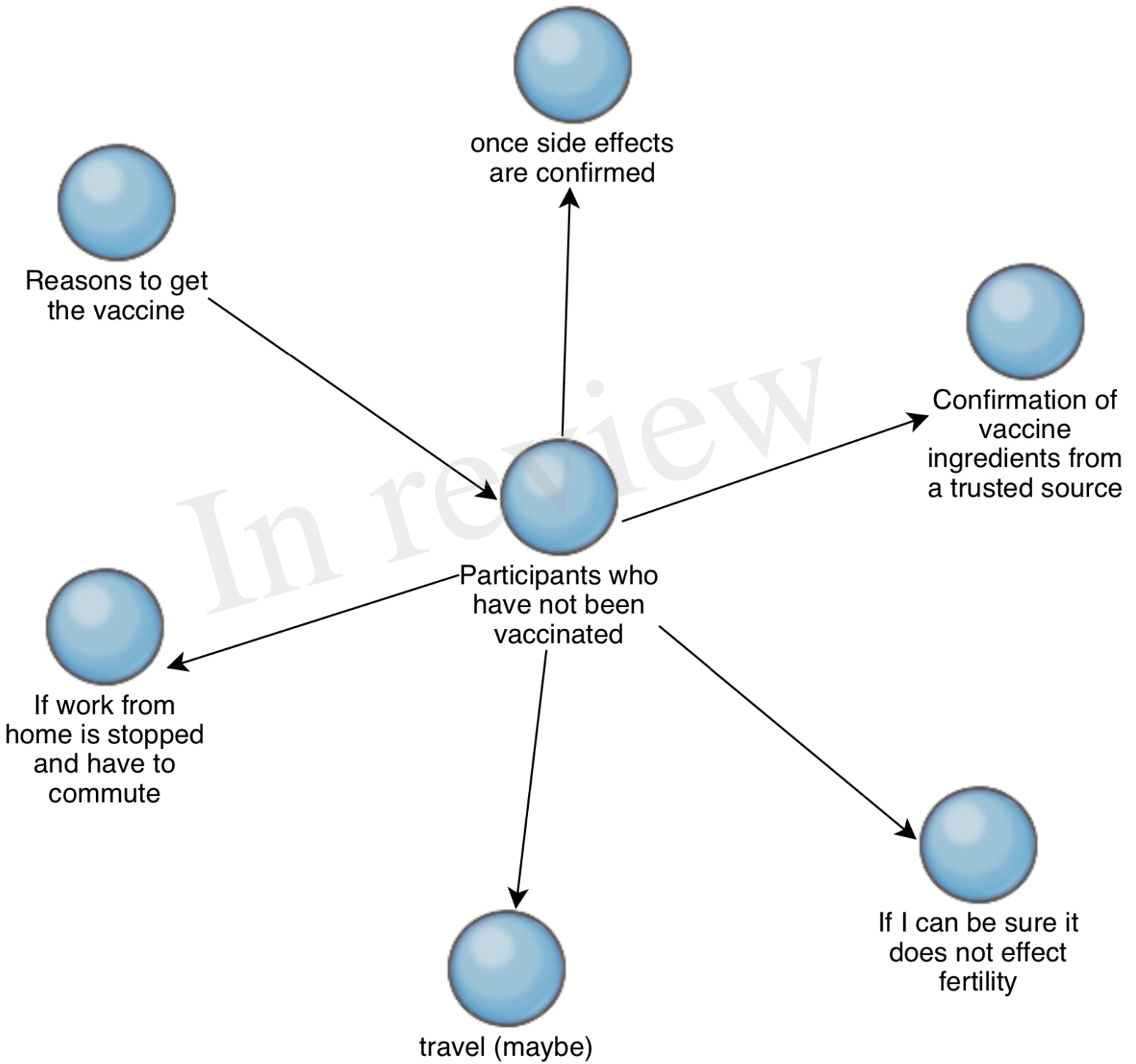


Figure 4.JPEG

