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Two Kinds of Vaccine Hesitancy

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ABSTRACT

We ask whether it is reasonable to delay or refuse to take COVID-19 vaccines that have been shown in clinical trials to be safe and effective against infectious diseases. We consider two kinds of vaccine hesitancy. The first is geared to scientifically informed open questions about vaccines. We argue that in cases where the data is not representative of relevant groups, such as pregnant women and ethnic minorities, hesitancy can be reasonable on epistemic grounds. However, we argue that hesitancy is not reasonable if a vaccine has passed well-conducted clinical trials. The second kind of hesitancy is to do with beliefs about the *institutions* offering a successfully trialled vaccine and the justifiability of cooperating with those institutions. For example, in the UK, distrust of the UK Government or the National Health Service is identified as a factor in the vaccine hesitancy of minority ethnic populations. We ask whether this sort of hesitation is reasonable given normative requirements of fair co-operation, both with those institutions and the wider population. We suggest that the answer is not straightforward. Sometimes the hesitation is unreasonable but understandable.

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Introduction

Vaccine hesitancy is ‘the delay in acceptance or refusal of vaccines despite availability of vaccine services’ (MacDonald and SAGE 2015, 4163). In this paper, we ask whether it is reasonable to refuse or delay taking a vaccine that has been shown in clinical trials to be safe and effective against an infectious disease. Is it reasonable to do so when many or most in one’s population are vulnerable to the infectious disease? It depends. We consider two kinds of reasonableness as they apply to two different kinds of vaccine hesitancy. The first kind is epistemic and geared to scientifically informed open questions about vaccines. For example, a vaccine that is safe and effective against previously encountered strains of a virus may not be known to be effective against a new strain. We argue that if evidence of efficacy is absent or far from conclusive, hesitancy is reasonable. Call this ‘open-question hesitancy’, where ‘open-question’ means a question that relevant scientific experts mostly agree is currently open.

There is a second kind of hesitancy grounded in beliefs about the *institutions* offering the vaccine and the justifiability of co-operating with those institutions. For example, in the UK, the COVID vaccine programme has been associated with the government and with the National Health Service. Distrust of these institutions has been identified as a factor in the vaccine hesitancy of minority ethnic populations. To illustrate, the harsh immigration policies of the UK government after 1988 were considered by some members of minority ethnic communities as reasons for not co-operating

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with the government's vaccine programme in 2020 (Treweek 2021b). Even minority ethnic NHS employees who did not doubt the efficacy of vaccines in general sometimes hesitated to take the COVID vaccine due to perceptions of racism from the NHS as an employer (Gogoi, Wobi and Qureshi 2022). Is this sort of hesitation reasonable in view of normative requirements for fair co-operation, both with those institutions and the public community? We suggest that the answer is not straightforward.

The two sorts of hesitation are connected. Public health interventions are subject to both norms of fair co-operation and norms of open-mindedness or indecision in the face of open questions. The limits of vaccine compliance are partly set by, on the one hand, the limits of virological knowledge at a time and the quality of relevant science communication and, on the other hand, perceptions of the fairness of public health institutions and governments. Second, in virology and medicine generally, there may be questions about whether vaccines, and treatment in general, sufficiently consider variation due to biological sex, age, race and ethnicity.

In the first part of the paper, we discuss epistemic norms relevant to scientifically open questions and whether hesitancy is reasonable given those norms in a range of cases. We focus on open questions about the representativeness of clinical trials in the US, novel vaccines such as mRNA vaccines, and new variants such as Omicron. In the second part of the paper, we consider a different kind of reasonableness geared to norms of co-operation and whether hesitancy is in keeping with these norms in a different range of cases. We focus on the UK to show how perceptions of institutional racism within and outside the healthcare system contribute to the refusal to co-operate with a vaccination programme.

Reasonableness and Open Questions

Scientific open questions are those that the most refined versions of relevant, reasonably well-confirmed theories do not (yet) answer. In practice, open questions are associated with the absence of expert consensus on the answer to a question that the experts agree is submissible to the theory or theories. In relation to vaccines, the relevant expertise is constituted by success in internationally recognised PhD programmes in virology, immunology or epidemiology, followed by practice in one or more of those disciplines, including through publication in peer-reviewed journals. If the relevant experts are uncertain, non-expert hesitancy is reasonable until the question is closed (assuming that when closed, vaccines are proven to be safe and effective). We'll call this kind of reasonableness 'open-question reasonableness' and the corresponding kind of hesitancy 'open-question hesitancy'.

At least two kinds of open question are relevant here. The first concerns the representativeness of clinical trials that establish a vaccine as safe and effective. The second involves concerns about novelty. We consider two cases of novelty: first, where a new vaccine such as mRNA is used to treat COVID-19 after it has passed clinical trials and, second, where an established vaccine that is shown to be effective against one variant of the virus is used against a new variant.

Novel Vaccines and New Variants

In 2015, the US Influenza Vaccine Effectiveness Network confirmed that the effectiveness of the seasonal vaccine against the dominant influenza variant was only 23% (Flannery, Clippard and Zimmerman 2015, 10). The vaccine was ineffective because it was designed for another strain that was wrongly predicted to be dominant. Nevertheless, the CDC recommended vaccination in conjunction with anti-viral medications. The reasons given were that vaccination could still prevent some infections, that it could prevent serious complications resulting in hospitalization and that it could provide protection from other known and unknown variants (Flannery, Clippard and Zimmerman 2015, 10).

Prima facie, vaccine hesitancy is reasonable in cases of reduced effectiveness like the influenza case above.¹ It is true that experts provided reasons to be vaccinated even though effectiveness was low; however, what they appealed to were speculative evaluations of the evidence, risk analyses concerning possible hospitalisations and future effectiveness against other known and unknown variants. Given that predictions about vaccine effectiveness on possible new variants do not necessarily rest on the strong evidential basis of a representative clinical trial, it is reasonable for laypersons to hesitate, particularly if they face significant burdens in getting vaccinated or if the benefits of being vaccinated are very minimal. Relevant burdens include the inability to take time off work (Denford et al. 2022), lack of nearby medical centres (Denford et al. 2022) and language barriers (Tankwanchi et al. 2021). A case where the benefits are minimal would be where one is very unlikely to become seriously ill from being vaccinated and where one cannot benefit others by being vaccinated, for example, if vaccination doesn't reduce transmission rates.

Newly Established Vaccines, Novel Viruses

Let us compare hesitancy based on low effectiveness with hesitancy based on the novelty of vaccines, such as mRNA COVID vaccines. These are novel vaccines applied to a novel virus. More specifically, they use RNA technology that was not FDA-approved for vaccines until 2021 (Dolgin 2021).² Vaccine hesitant people's worries about mRNA vaccines are typically more acute than their worries about traditional and therefore more established vaccine technologies (Mascellino et al. 2021; Wouters et al. 2021, 1030).

It might be thought that the novelty of mRNA vaccines is by itself a reason for open-question hesitancy. We don't know whether mRNA vaccines will be safe and effective until they have been used on the wider public; so we have reason to hesitate. Such a claim appears plausible, especially if combined with background concerns that the COVID-19 trials were unusually accelerated. But when we reflect on the requirements for emergency FDA approval, hesitancy appears much less reasonable on open question grounds.

The FDA requires clinical, non-clinical and manufacturing data before it will consider a vaccine for emergency use. To begin with, a vaccine must successfully have passed the first and second stages of the clinical trial process. Phase three trials need not be completed, but the FDA expects requests to include safety databases of over 3,000 vaccine recipients, 'who have been followed for serious adverse events and adverse events of special interest for at least one month after the completion of the full vaccination regimen' (FDA 2020). The emergency approval request must also include evaluations of the 'chemistry, manufacturing, and controls information of the vaccine' to ensure quality and consistency of the vaccine (FDA 2020). Again, emergency approval is granted in several stages. First, an independent data safety monitoring board reviews the data and informs the manufacturer of the results. If the manufacturer is satisfied, they may decide to submit the request to the FDA, whereupon their application is evaluated by the FDA's scientists and physicians; there is also a public meeting of the Vaccines and Related Biological Products Advisory Committee, made up of external scientific and public health experts. After this, the FDA's own professional staff consider the input of these contributors and completes the evaluation.

In the influenza case, there was an open question about whether the vaccine was worth taking due to ineffectiveness against the dominant strain. The CDC's recommendation to take the vaccine in that case was speculative, and laypersons could reasonably weigh the value of receiving a less effective vaccine against their other interests and needs. Still, they could not reasonably doubt the scientific fact, established in clinical trials, that these vaccines were relatively ineffective against the dominant variant. The question in the influenza case was: given that the vaccine has proved to be less effective for this strain, are there other reasons to get vaccinated? The question in the mRNA case is: does the current data submitted to the FDA for emergency approval sufficiently demonstrate that the mRNA vaccine is safe and effective? To answer the latter question, one needs the relevant technical expertise. And the relevant experts *were* involved in giving the mRNA vaccine emergency

approval. Of course, emergency approval doesn't mean that scientists stop testing the vaccine. But it does mean that experts have closed the question on efficacy and safety sufficiently to make it unreasonable for laypersons to challenge them on open question grounds and thus be hesitant on such grounds.

Old Vaccine, New Variant

The second case we consider is closer to the influenza case because it involves the safety and efficacy of an established vaccine against new variants. We discuss concerns that COVID-19 vaccines designed for the Wuhan strain would not be safe and effective against the Omicron variant of the virus.

Omicron was first detected in Botswana and South Africa in November 2021. It accumulated over 50 sense mutations in the genome, which led to a substantial evasion of naturally-induced and vaccine-induced immunity, resulting in increased transmissibility (Zarebska-Michaluk et al. 2022). The first-generation vaccines proved effective against other variants such as Delta, although this was due in part to a strategy of administering boosters to maintain higher levels of protection. But there were and continue to be concerns about the effectiveness of vaccines developed for the Wuhan strain against Omicron.

The first difference between the Omicron and the influenza cases is that the effects of a third dose of vaccine against Omicron are significantly better than a third influenza vaccine. Risk of hospitalization for Omicron is reduced by 81% compared to unvaccinated Omicron cases. A Pfizer/BioNTech or Moderna vaccine substantially increased protection against Omicron (Chenchula et al. 2022, 2972). Nevertheless, boosters for Omicron are less effective than they were against variants such as Delta (Pajon et al. 2022). Protection against Omicron wanes over time, with effectiveness against symptomatic infection decreasing by 24% and protection from hospitalisation decreasing by 5%, with further decreases projected by six months after boosters (Tartof et al. 2022; Zarebska-Michaluk et al. 2022). Except for evidence of mild symptoms from receiving boosters, no studies have revealed any safety concerns about receiving a third or even fourth dose. Indeed, scientists are currently considering the advisability of a fourth booster to deal with the problem of waning vaccine efficacy against Omicron (Chenchula et al. 2022, 2974; Zarebska-Michaluk et al. 2022).

There is a rough similarity between the influenza and Omicron cases. In both, an old vaccine targeted at one variant is less effective against a new variant, opening a question about whether vaccination is a good idea. However, there is a marked difference in effectiveness. The influenza vaccine's effectiveness was substantially lower, at 23%, compared with 73.9% at 2–4 weeks for the Moderna booster vaccine and 62.24% at 2–4 weeks for the Astra-Zeneca vaccine (Andrews et al. 2021; Chenchula et al. 2022). Given that initial effectiveness against Omicron is considerably higher after a third dose, and that the decreases in effectiveness over time may be reversed by a fourth dose, there may be greater reason not only to get vaccinated against Omicron, but to get booster jabs as well, at least if one is especially vulnerable to COVID. This is because the protection afforded remains high, even if not as high as it was for earlier strains. Thus, we conclude that hesitancy over using Moderna against Omicron is not reasonable on open-question grounds.

Vaccine Hesitancy Among Pregnant Women

We now turn to a second kind of open-question hesitancy, grounded on concerns that clinical trials have failed to be sufficiently representative. We first discuss the representation of pregnant women and then ethnic minority groups.

An informational video by Johns Hopkins School of Medicine published in December 2020 shows that there was no data on the effects of COVID-19 vaccines on pregnant women. However, studies in 2022 showed that the vaccines are safe and effective for pregnant women (Ellington and Olson 2022; Mu et al. 2022; Satin and Sheffield 2022). Conflicting

vaccine recommendations for pregnant women encouraged hesitancy among this group. For example, in the UK, some pregnant women took the mixed signals to indicate incompetence or a lack of reliable information, rather than developing science (Skirrow et al. 2022). Given that representativeness and data on the effects of vaccines changes substantially over time, we must consider the reasonableness of hesitancy at times that reflect those changes. Thus, we can ask:

- (1) Was hesitancy reasonable at t1, when it was an open question whether the vaccine was safe and effective for pregnant women?
- (2) Was hesitancy reasonable at t2, after clinical studies on pregnant women showed the vaccines to be safe and effective?
- (3) Does the conflicting messaging make hesitancy reasonable even when the question is closed (i.e. at t2)?

Representational open question cases of vaccine hesitancy could be formulated generally as follows:

- (1) Studies on the safety and efficacy of vaccine X do not represent subjects with property P.
- (2) If studies on X do not represent subjects with property P, it is an open question whether X is safe and effective for subjects with property P.
- (3) If it is an open question whether X is safe and effective for subjects with P, then it is reasonable for subjects with P to hesitate to take X.

The formulation is too general, because it permits reasonable vaccine hesitancy whenever a study fails to represent a group with a certain property. The solution to this problem is to distinguish relevant from irrelevant properties. A property P is relevant to a study just in case P makes (or is likely to make) a measurable difference to the conclusions of that study. For example, pregnancy potentially makes a measurable difference to whether COVID vaccines will be effective and safe for pregnant women. On the other hand, having dyed hair would be an irrelevant property. In the pregnancy case, women are at greater risk than those that are correctly represented or those who are unrepresented but with respect to an irrelevant property like dyed hair.

Let's consider the reasonableness of open-question hesitancy at t1 and t2. We noted earlier that the lack of data on vaccine safety and efficacy for pregnant women meant that the vaccines were initially not recommended at t1 (Johns Hopkins Medicine 2020). Here, hesitancy aligns with scientists' recommendations. However, at t2, the relevant clinical trials had taken place and so the question is no longer open. Pregnant women's reasons for hesitancy at t2 refer to the seeming contradiction in vaccine recommendations at t1 and t2 (Skirrow et al. 2022). If we focus purely on open-question hesitancy, hesitancy is unreasonable at t2 since at that point the question is closed. Nevertheless, given the perception among pregnant women of conflicting messaging, it is important that scientists and science communicators make it clear that the recommendation change between t1 and t2 is the result of science working properly, that is, moving toward a closure of a question the more relevant evidence accumulates. In these cases, open-question hesitancy is reasonable so long as the conflicts in information remained unresolved. Once they *are* resolved, and it is clearly communicated that the vaccines are safe and effective, it becomes unreasonable to continue to hesitate on these grounds.

It is important to stress that in cases of open-question reasonable vaccine hesitancy, one's hesitancy may still count as unreasonable if one does not follow alternative strategies to protect oneself and others from the vaccine. For example, if a pregnant woman refuses vaccination on the grounds that vaccine studies on pregnant women are not representative but takes this to mean that she can ignore hygiene practices, masking, social distancing and regular testing, then her hesitancy is in a sense unreasonable. Insofar as these other mitigation strategies have been shown to be safe and effective ways of protecting oneself and others from the virus

(Sarpawari et al. 2022), these are closed questions. Thus, while it may be reasonable to hesitate in getting vaccinated while questions about safety and efficacy remain open, one is required to follow alternative mitigation strategies which have been shown to be safe and effective means of mitigation. Indeed, one may even have stronger reasons to do so when one is unvaccinated (Kelsall 2024).

Vaccine Hesitancy Among Unrepresented Ethnic Minorities

The same considerations apply to the reasonableness of vaccine hesitancy among ethnic minority groups unrepresented or insufficiently represented in clinical trials. Many COVID-19 clinical trials in the US failed fully to represent certain ethnic minority groups. Khalil et al. (2022) note that research in COVID-19 clinical trials in the US was unrepresentative of Black and Hispanic groups, particularly in early (1 & 2) phases. They demonstrate that race is a relevant property for representation due to significant survival variances by race for vaccines, even after controlling for differences in socio-economic status and treatments (Khalil et al. 2022, 1). This underrepresentation limits the generalizability of research findings and misses the opportunity to engage with communities early to establish trust (ibid, 2). It also shows that race is a difference-making property, and thus one that needs to be represented in studies. Chastain et al. show that 'Black, Latinx, and Native Americans are dying from COVID-19 at rates disproportionate to their representation in the population in multiple US research trials' (Chastain et al. 2020, 59). Underrepresentation is not specific to COVID-19 clinical trials but affects most clinical trials (Flores et al. 2021; Loree et al. 2019), leading some to suggest that effective rectification requires overrepresentation (Artiga et al. 2021).

Ethnic minority under-representation differs from under-representation of pregnant women in two ways. First, while there was no representation of pregnant women in early COVID-19 studies, there was partial representation of ethnic minority groups. Second, despite a lack of full representation for ethnic minority groups, COVID-19 vaccines were still recommended to those groups. Thus, we must consider whether partial representation and recommendations based on partial representation have any bearing on whether hesitancy is reasonable on open question grounds. By making a comparison with a slight underrepresentation of women in clinical trials, we argue that the partial representation of ethnic minority groups is insufficient to rule out reasonable vaccine hesitancy.

In a review of 122 US clinical trials for COVID-19 prevention and treatment trials in the US population, Hong Xiao et al. (2022) found only 7.2% of participants were black, although black people make up 14.1% of the US population.³ To compare with another underrepresented group, women were only slightly underrepresented, with roughly 48% female versus 52% male. In other words, representation of black participants was just 53.7% while for women it was 85.1% with respect to their total populations (Xiao et al. 2022). If we adopt the view that there is a threshold at which virologists have enough data at which to close the question, we might think that 85% meets that threshold (especially in an emergency context), while just over 53% does not. Indeed, some scientists have expressed concerns about the failure of representation for some ethnic minorities, especially because some of these vaccines are being rolled out in countries where populations are mainly non-white (Gilmore-Bykovskiy, Jackson and Wilkins 2021; Pepperrell et al. 2021). The presence of these debates suggests that while there is sufficient data to close the question for a sufficiently represented group, such as women, the same is not the case for black people, who are substantially and persistently underrepresented across clinical trials. Given that the question is open with respect to a relevant property, it is reasonable for underrepresented ethnic minority groups to be hesitant on open question grounds. Again, such hesitancy only remains reasonable insofar as the question remains open. Once ethnic minority groups are sufficiently represented (assuming this is well communicated), open-question vaccine hesitancy becomes unreasonable as the grounds for reasonable hesitancy (an open-question) disappear. As with open-question hesitancy for pregnant women, the unrepresentativeness of vaccine studies does not mean that it is reasonable to refuse alternative

methods of COVID-19 mitigation, such as testing, masking and self-isolation, which have been shown to be safe and effective means of protecting oneself and others from the virus.

What Is Reasonable Co-operation?

We now turn to the second kind of hesitation, geared to beliefs about the *institutions* offering the vaccine and the justifiability of co-operating with those institutions. In these cases, concerns are not about open questions in vaccine science. Instead, institutions are perceived to be unjust to a particular class of people and are therefore inappropriate partners in action that supposedly aims at benefiting that class of people.

To address this issue, we adopt a Rawlsian understanding of reasonableness in co-operation. We call this ‘co-operation reasonableness’.

Rawls’ acknowledges that his norms of reasonable co-operation are a special case of a more general definition of reasonableness due to Sibley (1953; Rawls 1993, 49). Sibley provides a characterisation of reasonableness that is instructive both for understanding Rawls’ view and for understanding the distinction between reasonableness and rationality.⁴ For Sibley, rational agents aim to adopt those ends and means which are maximally in their own interests, whatever those interests happen to be (1953, 555–6). Moreover, they may consider others’ interests, but only insofar as they are relevant to satisfying their own. If maximizing the satisfaction of one’s own interests means frustrating or neglecting others’ interests, then that is rationally justified.

So much for rational people. Reasonable people, by contrast, are disposed: (1) to take the standpoint of others who are affected by their actions, and (2) to be influenced by these considerations such that they may be swayed to do things that are not maximally in their interests (Sibley 1953, 557). Reasonable agents see themselves as accountable to a common standard of reason in the sense that they are disposed not only to avoid acting in their own interests when doing so would negatively affect others, but also in the sense that they appeal to common standards when justifying their actions to others. Thus, if two people A and B were equally entitled to £500,000 and had the power to claim the total for themselves, the rational but unreasonable A would claim the total amount for herself. On the other hand, the reasonable but not fully rational B would recognise A’s equal entitlement to the share and propose an equal split (Sibley 1953, 554–5).

Rawls’ theory of fair and equal co-operation depends on Sibley’s conception of reasonableness (Rawls 1993, 49). This means that (as in Sibley) the parties justify actions/proposals by appealing to public standards that people can accept in common, including a norm of reciprocity. Rawls summarizes the idea as follows:

citizens are reasonable when, viewing one another as free and equal in a system of social cooperation over generations, they are prepared to offer one another fair terms of cooperation according to what they consider the most reasonable conception of political justice; and when they agree to act on those terms, even at the cost of their own interests in particular situations, provided that other citizens also accept those terms. The criterion of reciprocity requires that when those terms are proposed as the most reasonable terms of fair cooperation, those proposing them must also think it at least reasonable for others to accept them, as free and equal citizens, and not as dominated or manipulated, or under the pressure of an inferior political or social position. Citizens will of course differ as to which conceptions of political justice they think the most reasonable, but they will agree that all are reasonable, even if barely so. (Rawls 1997, 770)

In the cases we are about to discuss, vaccine hesitancy will be reasonable if it can be justified to all other reasonable citizens, including citizens who are not vaccine hesitant and who may be adversely affected by vaccine hesitancy.

Vaccine Hesitancy in Hostile Environments

We now consider cases where hostile environments result in vaccine hesitancy.⁵ A hostile environment with respect to a subpopulation in a jurisdiction is one where the majority of agents in power,

or a dominant group of agents, deny fair and equal treatment to the subpopulation whom they affect, sometimes by excluding them from the class of those entitled to that treatment. In this paper, we focus on two cases in the UK where the hostile environment is due to racial injustice.⁶ *Case 1* concerns racial injustice on the part of the UK government. *Case 2* concerns racial injustice within the NHS. We argue that although the reasonableness of hesitancy is questionable in each case, there is a sense in which the hesitancy ‘makes sense’ and should not be ignored or dismissed by those seeking to increase uptake among ethnic minority groups. In other words, we distinguish reasonable from *understandable* vaccine hesitancy, where the latter can be rationalised folk-psychologically.

We proceed in both cases by contrasting vaccine hesitancy with comparable cases where there is also hesitancy grounded in hostile environments. By noting the analogies and disanalogies between the cases, we show how vaccine hesitancy in both cases is unreasonable, despite appearances to the contrary.

Ethnic Vaccine Hesitancy

Our first case, which we call Ethnic Vaccine Hesitancy, is based on a review of 31 research studies of vaccine hesitancy. Treweek et al. found in this review that distrust of government institutions was a significant factor influencing vaccine hesitancy in ethnic minority adults in the UK (2021a, 7). They argue that government policy decisions and rhetoric when engaging with members of ethnic minority communities outside infectious disease emergencies can create hostile environments which minorities resent and which encourages unwillingness to partake in civic life, including civic responses to pandemics in the form of vaccine programmes. Treweek et al. cite the Windrush scandal⁷ and the Grenfell Tower disaster⁸ as examples of episodes that are signs of a hostile environment created by the UK government (Burger et al. 2021; 2021b, 1). In short, insofar as the UK government was perceived as one of the primary actors in the vaccine roll out, minority ethnic group resentment of that government’s hostile environment encouraged vaccine hesitancy. In the view of alienated minority citizens, the vaccine programme was primarily designed for the majority population and was rolled out with little attention to how damaging it might be to members of ethnic and racial minorities. Rhetoric to the effect that everyone was in the COVID crisis together, that the vaccine was for the good of all independently of race or ethnicity and that vaccination was simultaneously an act of self-protection and community protection was thus deeply doubted.

Bad Weather

We now consider a case analogous to but different from Ethnic Vaccine Hesitancy. We call it ‘Bad Weather’. Suppose that large parts of predominantly white populated areas in the UK, such as Suffolk and Norfolk, are devastated by bad weather. The UK government calls for volunteers from around the UK to help in the clean-up. Some members of marginalised ethnic minority groups refuse to volunteer because it requires cooperation with a government that is hostile to minorities, that identifies only with the white populations and that would not have called for a national volunteer effort if only a minority ethnic area was devastated by bad weather.

Bad Weather bears some analogies to *Ethnic Vaccine Hesitancy*, in ways that make refusal to cooperate with a vaccine programme seem as reasonable as refusal to cooperate is in *Bad Weather*. In both cases, there is a perceived hostile environment created by a government favouring a majority ethnic population that is itself perceived to be hostile to the minority community. In *Bad Weather*, refusal to volunteer is reasonable on Rawlsian grounds since the hostile environment created by the government and majority white population violates the terms of fair and equal co-operation and reciprocity. If there are instances of the government or majority populations failing to support ethnic minority communities in comparable disasters, then this is evidence of a lack of reciprocity. Thus, it is unreasonable to expect cooperation from minority groups who would not receive comparable treatment in a comparable situation. Moreover, if a sub-population is generally ‘othered’ by a national government and a majority national ethnic group, they are not accorded the equal respect

required for reasonable cooperation between agents, and so it is reasonable for them to hesitate or refuse to take part in the cleanup. To the extent that Ethnic Vaccine Hesitancy is analogous, it is reasonable to refuse cooperation with the vaccine programme.

However, *Bad Weather* is not analogous in all relevant respects to *Ethnic Vaccine Hesitancy*, and when we consider the differences, hesitancy in the vaccine case proves to be unreasonable. There are at least four key disanalogies. First, assuming the vaccine is tested and found safe and effective for the ethnic minority population, taking the vaccine is an act of self-protection. This point holds with force for some ethnic minority groups, such as Black African/Black Caribbean people, who have a greater mortality risk from COVID-19 (Office for National Statistics 2021). The self-protective character of co-operating with the vaccine programme distinguishes it from co-operation in *Bad Weather*, which mostly benefits the hostile majority population and doesn't benefit minorities helping in the clean-up from non-white areas of the UK.

The second disanalogy is that the vaccine was offered (eventually) to everyone, with prioritization only for health-care workers and for communities that were especially vulnerable to serious illness from COVID-19 such as the elderly, NHS patients and workers and people with underlying medical conditions. Vulnerable subpopulations included ethnic minority populations, and so when these were prioritised, majority population groups (White men under 40, for example) were placed further back in the queue for the vaccine than some ethnic minority subgroups. In this respect, the vaccine programme offered fair and equal terms of co-operation to the public because everyone benefited. Of course, the benefits did not come to everyone all at once, but the principle of prioritisation in play – protect the most vulnerable first – is widely endorsed in other health care contexts, and, in conjunction with the fact that Black and Asian communities are more vulnerable to being seriously ill with COVID, prioritises some in those communities, other things being equal.

A third disanalogy concerns reciprocity. One reason for refusing cooperation in *Bad Weather* is the belief that the government and the majority population would not reciprocate if minority population areas were under threat. But in the case of COVID, everyone is under threat and more people (from majority and minority populations alike) are benefited the more people get vaccinated. In the UK, most of the population is vaccinated. Moreover, the majority white population has the highest proportion of vaccine uptake at 89.4% (Office for National Statistics 2022). The very high take-up of the vaccine by the majority population benefits members of minority groups even if the benefit to others is not the primary intention of taking the vaccine.

A fourth disanalogy concerns the burdens of co-operation. Taking part in a clean-up operation often involves prolonged hard labour. Getting a flu jab, even from an out of the way location, is much less demanding. Thus, the reasonableness of non-cooperation in *Bad Weather* does not show that non-cooperation with the vaccine programme is reasonable.

In summary, the government's vaccine rollout programme offered members of the public fair and equal terms of co-operation, and the fact that most of the population is now vaccinated shows that most people are willing to take the required voluntary action to protect themselves and others. Moreover, since vaccination offers everyone self-protection, and protection for their own ethnic communities, there are reasons to be vaccinated even if one perceives or receives racial hostility from the majority community.⁹ In short, the reciprocity and fair and equal terms of co-operation mean that the health policies of the UK government in fact *reduce* the hostility of the hostile environment by the measure of relatively equal access to a beneficial good even for disfavoured minorities; so, it is unreasonable to be hesitant, whether this involves delay or refusal to vaccinate, based on cases of neglect of minority communities.

Ethnic Minority Distrust of an Employer

In this section, we ask whether hesitancy based on hostility toward the NHS as a racially biased employer is reasonable. Again, we use two contrasting cases and conclude, by a method of reasoning adopted in the preceding section, the answer may be ‘no’.

NHS as Employer

Our first case, which we call NHS as Employer, is once again based on social scientific findings. In their study on vaccine hesitancy among ethnic minority Health Care Workers (HCWs) in the UK, Gogoi et al. found that distrustful attitudes towards an employer was a key cause of vaccine hesitancy (Gogoi, Wobi and Qureshi 2022). Their findings were reflected in larger scale studies of HCWs (Woolf et al. 2021, 10). In an interview elaborating on the findings of her study, Gogoi explained that reasons for hesitancy included perceptions of discriminatory practices (not being put forward for career advancement and being denied other work opportunities) as well as perceptions of incompetence and unconcern for employee welfare relating to a lack of sufficient protection at work with Personal Protective Equipment (PPE) early in the pandemic (Gogoi 2022).

Consider now an analogous case outside the area of vaccines that tests intuitions about taking up beneficial offers from an unjust employer.

Bad Employer

Amizine is an online retailer that treats its employees unjustly. Staff without a university degree are permanently denied opportunities for significant career advancement, are underpaid, overworked and denied the opportunity to unionize. Anna lacks a university degree. She works in an Amizine distribution centre because she needs the money. Amizine offers its employees discounts of up to £1,000 per year on its goods. Anna refuses to buy products from Amizine at the discounted rates even though some of those would enable her to secure her flat against burglary, and she would not be able to afford to buy them from another seller. She refuses to buy those goods at a discount from Amizine on the ground that Amizine’s terms of employment unjustly disadvantage workers like her.

Bad Employer is analogous to *NHS as Employer* up to a point. Refusing to buy the beneficial security goods at a discount corresponds to refusing to take the vaccine. The vaccine was freely offered to HCWs and, what is more, frontline HCWs were given priority access to the vaccine (Office for National Statistics 2022). Again, hesitancy leading to vaccine refusal is an expression of distrust for the NHS as an employer in the groups that Gogoi studied, just as Anna’s refusal to buy the security goods at a discount is an expression of her disapproval of working conditions at Amizine. The question in both cases is whether the refusal of a benefit is reasonably chosen as a means of protesting about or improving conditions of employment. Why refuse the discounts or the vaccine rather than taking more conventional action associated with challenging working conditions, such as publicly withdrawing labour and picketing at the employer’s premises? Refusing the benefit seems unreasonable since it both sets back the agent’s interests and is not an obvious means of changing employment conditions.¹⁰

A part of the rationale for prioritising HCWs in the distribution of the vaccine is that they need protection from COVID-19 since their job throws them into contact with infectious patients. Thus, when it comes to the health policy of the NHS, it offered fair and equal terms of cooperation for its staff since it gives all of them the protection they need. Returning to Gogoi’s study, some ethnic minority HCWs complained that they were suspicious even about being prioritized for the vaccine due to failings earlier in the pandemic to provide them with PPE (Gogoi 2022). The suspicion was that the NHS had a special reason to encourage vaccination that hadn’t anything to do with protecting staff, since if staff protection had genuinely been an NHS goal, then better support to staff would have been provided when it came to PPE.

But it isn’t clear that problems surrounding access to PPE have any bearing on whether one should get vaccinated when a vaccine is available. What would be reasonable in that case would be

to refuse to work in a dangerous environment, since no employee should be put at undue risk by their employer. So HCWs who were on the frontlines and at risk of catching COVID because they didn't get PPE from their employers (Oliver 2021) could reasonably have refused to put themselves in that situation. But to refuse vaccination is to put oneself (and possibly others) at undue risk of catching COVID-19. Thus, refusal contradicts HCWs' claim that they want to be protected from a dangerous work environment.

Moreover, as the safety and efficacy of the vaccine has been established by people outside the NHS, it isn't clear why the NHS's practices as an employer, whether just or not, are relevant to vaccine take-up. To compare, if Amizine was the only company that delivered a life-saving drug that Anna needed, and this drug was designed and tested by a different company that Anna trusted, it would be unreasonable for Anna to refuse to co-operate with Amizine by using its delivery service. If she is already willing to be an Amizine employee to survive day to day, she should also be willing to co-operate with them to save her life. The same holds for the NHS employee faced with the offer of a vaccine with a trusted manufacturer that has trialled it satisfactorily.

Justifying Vaccine Hesitancy to the Community

So far, we have focused on the relationship between ethnic minorities and institutions like the NHS and government. But since co-operation reasonableness requires one to justify one's actions by reference to common standards that other reasonable people can accept, and to offer terms of fair and equal co-operation with others, we ought to ask whether ethnic minorities can justify their hesitancy to the wider public. This includes their own ethnic communities who are, in some cases, the most vulnerable to serious illness from COVID-19, or in the case of HCWs, vulnerable patients. It also includes people who, by taking the vaccine themselves, help to build up the immunity of the population without developing symptoms that require intensive care.

Let's begin with HCWs. Our question now is not whether HCWs reasonably co-operate with their employers. It is whether a HCW can reasonably expect vulnerable patients or potential patients to co-operate with them in a health care setting when, being unvaccinated, they pose a potentially life-threatening risk to that patient's health. We argue that hesitancy is unreasonable for HCWs because (1) patients and other HCWs are especially vulnerable to serious harm, and (2) HCWs already have special obligations to protect patients' health which require them to go beyond what a non-HCW would do, and they accept such obligations by being HCWs. HCWs are required to follow stricter hygiene practices and even receive certain treatments to protect patients. Even if one perceives that one's employer is discriminatory, it is still unreasonable to put other people's lives at risk by refusing vaccination. Moreover, if the complaint in the PPE case is that employers were failing to show due care to employees, then the same complaint can reasonably be levelled at unvaccinated HCWs by members of the public. It is unreasonable for ethnic minority HCWs (and HCWs in general) only to factor in how their actions relate to co-operation with their employers since they also work in an environment with vulnerable colleagues and patients, including patients who belong to their own ethnic minority groups.

While we have dwelt on the case of HCWs, the view applies generally, at least in pandemic contexts like COVID. Firstly, being unvaccinated and reaping the benefits of a majority vaccinated population is a kind of free-riding (Giubilini 2021; Kelsall 2024)—i.e. a failure of reciprocity. Second, while the hostile environment would justify hesitancy in cases where being vaccinated primarily protects those who have created and maintained the hostile environment (as in *Bad Weather*), being vaccinated also offers self-protection and protection for one's own ethnic minority group. It might be reasonable to refuse to co-operate with unjust institutions, but the demands of reasonable behaviour among one's own ethnic group may still make refusal to get vaccinated unreasonable. If reasonableness comes in degrees, we might think that hesitancy in the general case is less unreasonable than in the HCW case, simply because in the HCW case the affected communities are especially vulnerable and because

of the obligations that HCWs already must protect patients' health. However, we also claim, for the reasons outlined in this paragraph, that hesitancy in general is also unreasonable.

Understandable Vaccine Hesitancy

Arguing that the vaccine hesitancy of marginalised groups is unreasonable may lead one to the conclusion that we ought not take their hesitancy seriously, or worse, that we can further marginalise these groups by dismissing their concerns or even taking punitive measures to secure vaccination. Indeed, Kattumana suggests that calling the hesitancy of already marginalised groups unreasonable risks misconstruing or being insensitive to the genuine injustices behind such hesitancy (2022, 650). We disagree that this is necessarily the case. We suggest that although vaccine hesitancy in the ethnic minority cases discussed in this part of the paper is unreasonable, it is understandable, and because understandable, it ought to be taken seriously by medical professionals, governments and science communicators seeking to increase vaccine uptake among these communities.

The injustices of the government and health institutions that are associated with vaccine hesitancy, such as: workplace discrimination, problems with PPE, the Grenfell Tower disaster and the Windrush scandal, are all cases of serious injustice perpetrated by those institutions. It is therefore understandable – psychologically understandable – why some members of ethnic minority groups may be hesitant or unwilling to co-operate with these institutions. By understandability we refer to a folk psychological generalisation learned in ordinary experience that if (minimally) one agent is subject to hostility from another agent, then the subjected agent will feel resentful towards the person creating or contributing to the hostility and will avoid co-operation with them. If James bullies Nick every day at school, but one day the two must play on the same football team, we understand why Nick may be reluctant to be a team player, even if James is willing to co-operate for the sake of the team. Accordingly, we might prefer to persuade Nick to participate not by chastising him for not being a team player, but by chastising James for creating a hostile environment in which Nick refuses to co-operate when it would benefit him and his team. In other words, it is understandable why a person in a hostile environment would feel resentful and refuse to co-operate with those who create or contribute to that environment.

Applying the notion of understandability to our current case of vaccine hesitancy among ethnic minority groups, we can say that public institutions, scientists and science communicators must find ways of acknowledging and addressing the injustice caused by institutions. They must do so because these groups are understandably unwilling to co-operate with institutions that they perceive as creating a hostile environment.¹¹

The PPE case provides a compelling case in point. The complaint of ethnic minority HCWs in Gogoi's study was that failures to provide employees with vital protection early in the pandemic demonstrates a failure to care about their employees in a way that resulted in unnecessary danger, illness and death. One can understand, then, why HCWs may perceive their employers as part of a hostile environment and why they may cooperate with the employer less than wholeheartedly. We have argued that while it is reasonable to refuse to work for the NHS for its past failure to protect, it is not reasonable to refuse vaccination because (1) it *does* protect, (2) the failure to supply PPE is to some extent redeemed by the effectiveness of the vaccine programme and (3) one cannot reasonably expect co-operation from patients if one is unvaccinated. However, given that the NHS failed to support employees adequately early in the pandemic, and that failure weakened vaccine acceptance, the NHS has some responsibility for creating vaccine hesitancy. This makes even unreasonable vaccine hesitancy understandable in some cases.

Notes

1. Of course, this partly depends on the group in question. For vulnerable 80-year-old patients, getting a 23% vaccine could well still be worth it, given the dangers of catching Influenza. But for a young, healthy male, there

seems little benefit in taking a 23% effective vaccine, since he is unlikely to be substantially harmed by catching the virus in the wild.

2. Dolgin's history of RNA technology shows that although RNA technology has been around for a long time, its use in vaccines is recent. The first clinical trial for a vaccine using RNA technology was 2010, and the COVID-19 vaccines were the first FDA approved vaccines using this technology. The report also outlines how, historically, RNA technology was generally regarded as too unstable and expensive for effective use in vaccines by scientists.
3. The same argument applies in the UK where there was 0.6% representation of Black people, who make up 3.4% of the whole population, meaning overall Black representation 16.67% (Armitage 2022).
4. Subsequent philosophers also use the Rawls/Sibley characterisation of reasonableness when distinguishing the concept from rationality (Boettcher 2004; Gewirth 1983; Grossmann and Eibach 2020; Sala 2021). The distinction has also been found in folk standards of judgement (Grossmann et al. 2020).
5. Race relations, especially those concerning historical and present-day injustice differ across different nations. As such, we do not generalise our findings here though we do think this worth exploring in further research.
6. One could make similar arguments with respect to other forms of injustice in different places, e.g. gender injustice concerning women's health in Ireland, or racial injustice in the US. In the former case, the cervical cancer scandal in Ireland, which resulted in many women dying of cancer due to the failure of medical institutions to be transparent about failures in their cervical cancer screenings (Grodzicka 2021). In the latter case, racial injustice such as the Tuskegee experiments, in which Black men with syphilis were refused treatments so that scientists could study the natural progression of the disease (Boulware et al. 2003). Both are examples of hostile environments created by public institutions that result in the kind of hesitancy we discuss in this section.
7. The Windrush scandal concerned the deportation from the UK of residents who came legally to the UK from the Caribbean after World War 2. One of the ships carrying immigrants was called The Windrush. 'Windrush generation' refers to postwar immigrants from the Caribbean in general. Until the introduction of the Immigration Act 1988, members of the Windrush generation were permitted by the UK government to come and go freely, and to reside in the country indefinitely. The 1988 Act withdrew that right for people absent from the UK for more than two years, along with the right of people with the right to reside to be joined by relatives. Many could not produce documents after 1988 proving that they had the right to reside, and in 2014 some were ordered to return to places or origin they had by then no substantial connection to.
8. The Grenfell Tower was a residential block in London that burned down in 2017 with the loss of 70 lives. The fire was considered a national disaster in the UK. Some of the residents who survived and were made homeless by the fire were subletting flats without being entitled to stay in the UK, and the UK government decided not to compound their misfortunes by making an issue of their immigration status. Instead, residents were given a procedure to follow that would regularise their immigration status over a period of five years. Nevertheless, the immigration issues associated with the disaster have added to the perception that the UK government is unduly harsh when it comes to enforcing its increasingly restrictive policies on legal residence.
9. This is assuming that ethnic minorities have been sufficiently represented in studies. Interestingly, where they are not, open-question reasonableness and co-operation reasonableness overlap. Underrepresentation creates an open question about whether vaccines are safe, effective and a situation of inequality. Inequality in the sense that if ethnic minority groups are expected to get vaccinated despite being unrepresented in trials, compared to white people who are represented in trials, there is greater risk for the minority group. Thus, unrepresented ethnic minorities can delay vaccination on open question and co-operation grounds.
10. One could argue that there is a slight disanalogy between the two cases, in that in Bad Employer, Anna still benefits the company by purchasing products at a discounted rate, while in the NHS case, there is no such benefit to the institution if one receives vaccination. To make the case more analogous, we could suppose that the company offers Anna a free security system that she could not get anywhere else. In this case, it seems even less reasonable to refuse, since the only person to benefit from the security system is Anna herself. Likewise, the primary beneficiary of a vaccine is the person who receives it, not the NHS who facilitates it. (The NHS does benefit, of course, from having a workforce with less illness.)
11. Moreover, there is some research that shows that of all vaccine hesitant groups, Black communities are more malleable in their intention to vaccinate than their white hesitant counterparts (Padamsee et al. 2022). Padamsee et al. argue that while Black hesitancy is generally grounded in institutional mistrust created by historical injustice, Black communities are like to 'embrace vaccination once they are convinced that vaccines are safe, effective, and necessary' (Padamsee et al. 2022, 8). This finding is important, because it gives reason to be hopeful that addressing and acknowledging vaccine hesitancy that is grounded in institutional mistrust might go a long way to increasing vaccine uptake, at least among Black ethnic minority groups. It is also worth noting that in the broader context of hesitancy, discourse with vaccine sceptics is suggested as one of the most important ways to encourage social and epistemic trust (Freiman 2023, 373).

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