Journal of Clinical Epidemiology 168 (2024) 111268

Journal of Clinical Epidemiology

METHODOLOGICAL CONSIDERATIONS RELATED TO EQUITY, DIVERSITY, AND INCLUSION IN CLINICAL EPIDEMIOLOGY

Using the GRADE evidence to decision framework to reach recommendations together with ethnic minority community organizations: the example of COVID-19 vaccine uptake in the United Kingdom

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Accepted 24 January 2024; Published online 1 February 2024

Abstract

Objectives: To make recommendations regarding factors that affect COVID-19 vaccine uptake by ethnic minority individuals in the United Kingdom, together with strategies that could be used to increase uptake.

Study Design and Setting: The results of two rapid systematic reviews—one identifying factors that affect respiratory vaccine uptake in ethnic minority adults and the other identifying experimental evaluations of strategies to increase vaccine uptake in ethnic minority adults—were put into Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) Evidence to Decision frameworks to support discussion with a panel of ethnic minority community organizations, community-focused small companies, and academics of the relevance of the review findings to the UK COVID context. Aided by the frameworks, the panel made recommendations for factors that need to be addressed to increase vaccine uptake, and for which strategies might be used to increase uptake.

Results: Our two reviews contained 31 relevant research studies published in English between 2016 and 2021, all of which were from the United Kingdom (8/31), the United States (20), and Australia (3). We identified six factors—two linked to trust, three linked to information, and one on accessibility—that affected uptake. Strategies that had been evaluated fell into three categories: using trusted messengers, tailoring the message, and increasing convenience. These were put into GRADE Evidence to Decision frameworks and discussed over a series of meetings with individuals from nine ethnic minority community organizations and two community-focused small companies and academics. Community partners provided insight into why ethnic minority individuals in the United Kingdom had lower vaccine uptake, particularly with regard to the impact of nonhealth-related UK Government policy on individuals' heath decision-making.

Funding: This work was supported by the UK Economic and Social Research Council [grant number ES/W001403/1].

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https://doi.org/10.1016/j.jclinepi.2024.111268

Recommendations included recognizing that trust will be low among some ethnic groups, thinking more broadly as to who messengers should be in a low-trust environment, ensuring that information is tailored to the information needs of specific ethnic groups and working to increase convenience. Our results are at https://www.collaborationforchange.co.uk.

Conclusion: GRADE Evidence to Decision frameworks could be used more widely to structure discussions of research evidence between researchers, community organizations, and other nonresearch partners.

Keywords: Vaccine uptake; Vaccine curiosity; Ethnic minority; Equity; COVID-19; GRADE evidence to decision frameworks

1. Introduction

In February 2021, the UK Parliamentary Under-Secretary of State for COVID-19 Vaccine Deployment told Sky News '*If one particular community remains unvaccinated, then the virus will seek them out and it will go through that community like wildfire*.' [1]. Data from January 13, 2021 on 23.4 million adults in England showed that 43% of White over 80s who were not living in care homes had received their first dose of the COVID-19 vaccination compared to 34% of Indian/British Indian over 80s, 23% of Bangladeshi/British Bangladeshi over 80s, and 16% of African over 80s [2]. By June 2022, vaccination rates for the over-80s were high for all ethnic groups but the difference between highest uptake (White, at 98%) and lowest (African, 75%) was still more than 20% [3]. These same data showed that first COVID-19 vaccination rates for those aged 50−54 were 90% for White people compared to 88% for Indian/British Indian people, 76% for African people, and 63% for Caribbean people [3].

Substantial differences by ethnicity have persisted. For example, only 52% of Black Caribbean adults in England continued to four COVID vaccinations compared to 78% for White British adults [4]. Uptake of COVID-19 vaccines by some ethnic minority people has been a substantial concern for all connected with the UK vaccine rollout program, including as a function of ethnicity [5].

For much of the pandemic, UK Research and Innovation (https://www.ukri.org) offered emergency funding routes for COVID-19 research. Our collaboration was awarded funding in 2021 to look at the factors that influence vaccine uptake by ethnic minority people and the strategies that might increase uptake. A hallmark of this work is that it was designed and undertaken collaboratively through partnerships between diverse ethnic minority community organizations and community-focused small companies and academics. The results of this study were made public on December 1, 2021 on our website, https://www.collaborationforchange.co.uk.

The aim of this paper is to describe the process we used to reach our recommendations, which we think might be useful to other researchers wishing to work together with community organizations in a way that gives a strong voice to stakeholders.

2. Methods

2.1. The collaboration for change: promoting vaccine uptake

Our collaboration, called 'The Collaboration for Change: Promoting vaccine uptake' (https://www.collaborationforchange.co.uk), comprised nine UK ethnic minority community organizations, two community-focused small companies, and two UK universities (Table 1). Five of the community organizations were represented as grant co-applicants, with the remaining four being brought into the collaboration to bring additional perspectives. Egality Health, a community engagement agency that works to improve inclusion in health research (https://egality.health), acted as the point of contact between community organizations and researchers.

2.2. Gathering global evidence on vaccine uptake by ethnic minority people

Two rapid reviews were completed in the early phase of our work by the University of Aberdeen's Evidence Synthesis Team, one of nine groups in the United Kingdom funded by the National Institute of Health and Care Research, the United Kingdom's largest public health research funder, to do systematic reviews. The first review focused on identifying factors that affect uptake of vaccines in ethnic minority adults, specifically those used to protect against diseases of the lungs and airways. The second aimed to identify experimental evaluations of strategies that aimed to increase vaccine uptake in ethnic minority adults. Both reviews looked at the global literature and were done to provide data to underpin discussions with our community partners. The protocols are in Supplementary Files 1 and 2, search strategies in Supplementary File 3, review eligibility criteria are summarized in Table 2, and reasons for exclusion after full text checking in Supplementary File 4. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist in Supplementary File 5 gives additional details about review methods. We chose to include studies involving non-COVID respiratory viruses because (1) we did not expect many high-quality studies for a new virus and (2) we thought we could learn from uptake of other respiratory vaccines by ethnic minority

What is new?

Key findings

- A GRADE Evidence to Decision framework was well suited to facilitating evidence-informed discussions between researchers, community organizations, and other nonresearch partners regarding uptake of the COVID-19 vaccine by ethnic minority individuals in the United Kingdom.

What this adds to what was known?

- GRADE Evidence to Decision frameworks can support discussions of research evidence between researchers, diverse ethnic community organizations, and other nonresearch organizations.

What is the implication and what should change now?

- GRADE Evidence to Decision frameworks have a useful role in working with nonresearch active organizations that work with, or represent, diverse ethnic communities when developing evidence-informed recommendations.
- Also involving 'implementers'—those tasked with putting recommendations into practice—is likely to facilitate and speed up uptake of recommendations.

people. The extracted data from both reviews, as well as the characteristics of the included studies, quality assessment (using The Quality of Reporting tool, QuaRT), and evidence synthesis, are available through ReShare (https://dx.doi.org/10.5255/UKDA-SN-855248), the UK Data Service data repository [6].

Our two reviews found 31 relevant research studies published in English between 2016 and 2021, all of which were from the United Kingdom (8/31), the United States (20), and Australia (3). From these, we identified six factors that affect vaccine uptake in ethnic minority adults, and three strategies to improve uptake.

2.2.1. Factors

1 Trust in organizations.
2 Trust in individuals.
3 The availability of appropriate information.
4 The use of appropriate language.
5 Discussion of harms vs. benefits of the vaccine.
6 Vaccines are offered in easily accessible ways and places.

2.2.2. Strategies

1 Communicating using trusted messengers.
2 Tailoring the message.
3 Enhancing convenience (eg, flexible venues and times).

The applicability of this evidence to the UK context needed to be assessed, a task similar to that faced by the guideline panels. These assessments are complex and panels generally need a structure to ensure that research evidence and important criteria are considered in a consistent, standardized way rather than relying on open, unstructured discussion. We chose the GRADE Evidence to Decision framework [7] to structure discussions with community organizations. We made this choice for two reasons. First, S.T. was part of the team that developed the framework, and was therefore familiar with its aims and structure. Second, the framework is an established tool and widely used by major guideline producers, including the World Health Organization [8,9], the World Allergy Organization [10], National Institute for Health and Care Excellence [11], and disease-focused guideline initiatives such as the European Commission Initiative on Breast Cancer [12,13].

3. Results

3.1. Choosing our evidence to decision framework

There are several versions of the Evidence to Decision framework (https://training.cochrane.org/online-learning/cochrane-methodology/grade-approach/other-publications-grade-working-group) depending on the type of decision being made. As we were interested in vaccinations, we selected the 'Health population-level health system and public health' decisions as the best starting point for our work [14]. We wanted to apply the framework to a discussion of qualitative factors that affect uptake as well as to initiatives to increase uptake and this meant some modifications were needed. Not all of the original questions on the framework were relevant for the qualitative factors discussions. Moreover, as the majority of individuals involved in our discussions were representatives of community organizations rather than researchers, we thought some small changes to language were needed.

Table 3 shows the questions in our two modified frameworks compared to the original 'Health system and public health' Evidence to Decision framework. The two modified frameworks are given in Supplementary Files 6 and 7.

3.2. Discussing the factors and strategies

The extracted data from our two reviews [6] were put into six 'factor' frameworks and three 'strategy' frameworks. These completed frameworks were then discussed in five, 2-hour Zoom meetings held in August and September 2021.

The pattern for meetings was similar. After initial housekeeping chaired by R.S., the framework was shown to everyone using Zoom screen sharing and we worked through the questions. The process was steered by S.T. whose main role was to ask the questions and type people's contributions into the 'Comments' section of the framework as people spoke in real time while screen-sharing. In this way, everyone could see what was being recorded and a rough written record of the discussion was immediately available at the end of the meeting. Each session was also audio-recorded.

The recorded text almost exclusively represents contributions from community organization partners; the academics and others acted as technical team and facilitators, occasionally prompting community partners to clarify or elaborate on their responses. After each meeting, S.T. reviewed the framework to correct typos and the framework was approved, or discussed again, at the next meeting.

Discussion started with the '*Trust in organizations*' factor and the first 2-hour meeting covered only this factor's framework. Subsequent meetings generally discussed more than one framework, usually to finish off one and start another. All collaboration members were invited to all meetings. The project timetable meant that the majority of meetings had to be held in August, which is peak holiday time in the United Kingdom, but meetings generally had around 10 or more participants who were a good mix of community organization and other collaboration members. The final text of all completed frameworks was circulated to, and approved by, all Collaboration for Change partners.

3.3. What did community organization partners say?

The completed Evidence to Decision frameworks are a full record of discussion. They include evidence summaries, discussion summary, our recommendations and the justification for them, as well as implementation and evaluation considerations. All are available at ReShare (https://dx.doi.org/10.5255/UKDA-SN-855248) [6] and www.collaborationforchange.co.uk.

We decided that some of the six factors fit together and could be combined to make just three main factors: *Trust*, *Information*, and *Accessibility*. The three strategies remained as *Trusted messengers*, *Tailoring the message*, and *Flexible venues and times*. We have given a selection of quotes for each of the three factors and three strategies

Table 1. The Collaboration for change partners

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12	Reach Health (Glasgow; https://www.reachhealth.org.uk)	Shabir Banday (shabir@reachhealth.org.uk)
13	Kanlungan (London; https://www.kanlungan.org.uk)	Susan Cueva (susancueva@kanlungan.org.uk)

[a] Partners were grant co-applicants.

Table 2. Summary of the inclusion criteria for the two rapid reviews

Review 1: Factors that affect uptake of vaccines in ethnic minority adults.

Setting	Perspective	Phenomenon of interest	Comparison	Evaluation
(Where?)	(For whom?)	(What?)	(Compared with what?)	(With what result?)
In the community	Adults from ethnic minority population	Vaccine hesitancy related to COVID-19 and other respiratory viral infections	By implication only: compare different ethnic groups, or different subpopulations within ethnic groups	Factors related to vaccine hesitancy

Review 2: Experimental evaluations of strategies that aimed to increase vaccine uptake in ethnic minority adults.

Population	Intervention	Comparison	Outcome	Study design
Adults from ethnic minority population	Any intervention addressing vaccine hesitancy related to COVID-19 or other respiratory viral infections	Another intervention or no intervention	Vaccine uptake	'Experimental design' with a control group

Full details are given in Supplementary Files 1 and 2.

below. We did not record who made a comment; each comment in the framework is a collective view.

3.4. Factors

3.4.1. On trust

'The 'hostile environment' rhetoric in the United Kingdom is an important influencer of trust regarding a person's position in society. This is not just about vaccines and National Health Service (NHS) but, for example, Windrush scandal and Grenfell Tower fire. These set the tone for minority ethnic voices not being heard or believed. The growing far right movement and how this has been handled contributes to the mistrust.'*

'Mistrust in this context is entirely justifiable; it is based on past behavior by organizations. This is not about reprogramming ethnic minority communities but reprogramming organizations.'

3.4.2. On information

'Some people talk about information they have got from 'back home' saying we should do this or that, and this is different from UK guidance. Many choose to follow the guidance from 'back home' rather than United Kingdom, information easier to understand and access. A major issue.'

'Language has to be accessible. Communities are multigenerational, and some might be able to read a language, but not speak it. Others are the reverse. Accessibility is very important for this. The NHS is trying to help, with videos, conferences, etc. But need to look at accessibility and how to engage with people linked to the community that is being targeted.'

3.4.3. On accessibility

'Much was made of multigenerational households for ethnic minorities but the vaccine invitations came by age, meaning some older people had no family help to get vaccine and costly to have multiple trips rather than a single trip for household.'

'What works—community organization asked to do this. Use existing facilities; know where people are in their everyday activities. But we were late in being commissioned to do this. Some of our offers were not taken up. No-one came back with a response.'

3.5. Strategies

3.5.1. On trusted messengers

'We (a community organization) asked what was source of motivation to take up vaccine (ie, who motivates you to accept the vaccine)—distant third was health professionals (first was own views, second was family opinions). A lack of trust, access to health professionals, maybe poor at selling the vaccine to people who have some questions.'

'Anticipated benefits of trusted messengers can be large in face of misinformation and doubts among groups. It is hugely beneficial to have someone who is able to talk to you and someone who you know and trust personally would be most beneficial.'

* 'Hostile environment' was a set of UK Government policies introduced in 2012 by the then Home Secretary Theresa May. The aim of these policies was to reduce immigration. The Windrush scandal is named after a ship called the Empire Windrush that arrived in the United Kingdom in 1948 carrying 1,027 people from the Caribbean. The scandal began in 2018 and saw hundreds of Caribbean immigrants who had been living and working in the United Kingdom for decades wrongly targeted by immigration enforcement. The Grenfell Tower fire happened in a London tower block in 2017. The fire spread rapidly because of combustible exterior cladding that did not comply with building regulations. A total of 72 people died, the majority of whom came from ethnic minority communities.

Table 3. The questions in our two modified frameworks compared to the original 'health system and public health' evidence to decision framework

Questions in the original 'health system and public health' evidence to decision framework	Questions in the modified framework used for our 'factor' discussions	Questions in the modified framework used for our 'strategy' discussions
Is the problem a priority?	Is the factor important?	
How substantial are the desirable anticipated effects?	How big are the anticipated benefits?	How big are the anticipated benefits?
How substantial are the undesirable anticipated effects?	How big are the anticipated harms?	How big are the anticipated harms?
What is the overall uncertainty of the evidence of effects?	How certain are we about the above?	How certain are we about the above?
Is there important uncertainty about or variability in how much people value the main outcomes?		
Does the balance between desirable effects and undesirable effects favor the option or the comparison?	Is the factors barrier or an enabler?	Does the balance between benefits and harms favor the strategy or the comparison?
How large are the resource requirements (costs)?		How big are the costs/savings?
What is the certainty of the evidence of resource requirements?		How certain are we about the costs/ savings?
Does the cost-effectiveness of the option favor the option or the comparison?		Does the cost-effectiveness of the strategy favor the strategy or the comparison?
What would be the impact on health equity?		What would be the impact on health equity?
Is the option acceptable to key stakeholders?		Is the strategy acceptable to key stakeholders?
Is the option feasible to implement?		Is the strategy feasible to implement?
Type of recommendation/decision	Type of recommendation	Type of recommendation
Recommendation/decision	Recommendation/decision	Recommendation/decision
Justification	Justification	Justification
Subgroup considerations	Subgroup considerations	Subgroup considerations
Implementation considerations		Implementation considerations
Monitoring and evaluation considerations		Monitoring and evaluation considerations
Research priorities	Research priorities	Research priorities

Blanks mean that the questions were not used in our framework

3.5.2. *On tailoring the message*

'Discussions of harm depend on where a person in their life, for example, young people interested in future, pregnant women to unborn child, sometimes older people did not share the concerns because they said we have lived our lives and whatever happens, happens. The message needs to be tailored to perception of harms.'

'A lot of the COVID vaccine material was a straight regurgitation of existing material, not very practical, and need more verbal and more visual presentations. The poor translation element may have miscommunicated the message.'

3.5.3. *On flexible venues and times*

'People want flexibility, but they are also worried about being specifically targeted by a system they do not trust. Having a special vaccination locations/center just for them may not always work. Creating protected time at an existing vaccination site, and making getting there easy (eg, by providing transport) may be better.'

'Also worked with NHS to commission a vaccine bus, also very successful in terms of accessing communities. For example, mosque would have 300 waiting after prayers, also Chinese communities. Need to fit into existing activity.'

3.6. *The recommendations reached using the framework*

The recommendations we reached are in Tables 4 and 5.

These recommendations, and the discussions that led to them, can be reduced to three key take-home messages for the entire project shown in Fig. 1. Trust, culturally and

Table 4. Recommendations linked to *Trust, Information,* and *Accessibility* as factors affecting COVID-19 vaccine uptake in ethnic minority individuals. The full Evidence to Decision frameworks including evidence summaries, discussion summary, recommendation justification, subgroup considerations, and research priorities are at ReShare, the UK Data Service data repository [5] and www.collaborationforchange.co.uk

Trust			
Component	**Barrier or enabler when present?**	**How big are the anticipated benefits/harms of not addressing?**	**Recommendation**
Is there trust in organizations?	Enabler	Benefit/harms both vary from large to small.	Evidence from the United Kingdom and the United States, plus our own experience, suggests that having trust in the organizations promoting the COVID vaccine is among the most important factors in terms of whether people from ethnic minority groups accept the offer of the vaccine. Conversely, not having trust in those organizations makes uptake less likely.
		Our certainty about the above is high	There has been a historical neglect of engagement with ethnic minority communities by organizations that promote vaccine uptake. These organizations need to engage with community groups and members, listen to the concerns raised, and make changes (including to vaccine delivery) as suggested by those communities.
Is there trust in individuals?	Enabler	Benefit/harms are both moderate	Evidence from the United Kingdom, the United States, and Australia, plus our own experience, suggests that having trust in the individual(s) promoting the COVID vaccine is an important factor in terms of whether people from ethnic minority groups accept the offer of the vaccine. Conversely, not having trust in those individuals makes uptake less likely.
		Our certainty of the above is high.	To have the trust of ethnic minority groups, individuals talking about vaccines need to be seen as honest and nonjudgmental, make it clear why they support the vaccine, speak in a way that people can understand, and be willing to spend time discussing individual concerns. Local GPs and trusted individuals from the nonhealth sector can play an important role.
Information			
Component	**Barrier or enabler when present?**	**How big are the anticipated benefits/harms of not addressing?**	**Recommendation**
Is appropriate information available?	Enabler	Benefit/harms both vary from large to small.	Evidence from the United Kingdom and the United States, plus our own experience, suggests that the availability of appropriate information (i.e., tailored to the specific information needs of its audience and delivered in a way that is culturally and linguistically acceptable) is an important factor in decisions to accept the COVID-19 vaccine.
		Our certainty about the above is high.	This is about more than translating one world language into another, but ensuring the information is provided in a way that ethnic minority individuals find acceptable, answers their concerns, and pays attention to the information coming from countries outside the United Kingdom, with which they may have ties. Knowing what is needed requires collaboration with ethnic minority groups.

(*Continued*)

Table 4. Continued

Component	Barrier or enabler when present?	How big are the anticipated benefits/harms of not addressing?	Recommendation
Information			
Is the use of language appropriate?	Enabler	Benefit/harms both vary from large to small.	Research evidence from the United Kingdom and our own experience suggests that appropriate language (by which we mean language that is culturally acceptable and pitched at the right literacy level for its audience) is a factor affecting decisions to accept the COVID-19 vaccine. 'Language', however, does not just mean which world language (e.g., English or Urdu) that a document is written in, but also includes consideration of language usage (culturally appropriate, not overly scientific, lay language) and whether the most appropriate way to present this language is to write it down, speak or sign it, or use a multimode delivery format.
		Our certainty about the above is high.	Language itself is unlikely to be the dominant factor in a decision to accept or not accept the COVID-19 vaccine. However, when it comes to the effective transfer of information, language can be an important factor. The impact of language on decisions may be smaller than is often thought, with other factors, like trust, dominating. Better use of language will, however, support more informed discussions among ethnic minority communities about the COVID-19 vaccine.
Is there a discussion of harms vs. benefits of the vaccine?	Could be either.	Benefit/harms are both moderate	Evidence from the United Kingdom, the United States, and Australia, plus our own experience, suggests that the perceived balance between the potential benefits of the COVID-19 vaccine and the potential harm of the vaccine is an important factor in decisions about accepting the COVID-19 vaccine.
		Our certainty of the above is high.	The issues that fall on either side of that balance are changing. Earlier in the pandemic, both harms and benefits were mainly health-related. Now, they include the ability to participate in society as rules change. The harms that people have concerns about depends on where a person is in their life—younger people have different concerns to older people. Stories of harm, real or not, can travel far and have an impact beyond the actual likelihood of experiencing the harm. Organizations promoting vaccine uptake need to counter misinformation, by using the same platforms as those spreading the misinformation.
Accessibility			
Are vaccines offered in easily accessible ways and places?	Enabler	Benefit/harms are both large to moderate	Evidence from the United Kingdom, the United States, and Australia, plus our own experience, suggests that having good accessibility to vaccination, meaning location, transport options, and/or flexibility in the time of the appointment, is an important factor in decisions about accepting the COVID-19 vaccine. For some, poor accessibility is enough to prevent getting the vaccine, although the person is open to the idea of getting the vaccine.

(*Continued*)

Table 4. Continued

Component	Barrier or enabler when present?	How big are the anticipated benefits/harms of not addressing?	Recommendation
Accessibility			
		Our certainty of the above is high.	NHS public health authorities need to work with community organizations to select alternative ways of delivering the vaccine and, importantly, cede control of delivery to community organizations where needed, because they may have a level of trust in a given community that the NHS does not.

NHS, National Health Service.

linguistically tailored information and offering vaccination at convenient places and times are essential for successful vaccine delivery. Any approach to increasing vaccine uptake in ethnic minority people will have to directly consider all three strategies.

4. Discussion

A structured process using GRADE Evidence to Decision frameworks allowed us to present international research on COVID-19 and other respiratory vaccine uptake by ethnic minority individuals to community organization partners and discuss the relevance to the UK context. Our structured approach allowed us agrees recommendations regarding the factors affecting uptake of the COVID-19 vaccine in the United Kingdom under the headings of *Trust*, *Information*, and A*ccessibility* (Table 4). Three matching strategies—*Trusted messengers*, *Tailoring the message*, and *Flexible venues and times* (Table 5)—are recommended to tackle these factors and to increase vaccine uptake.

We think Evidence to Decision frameworks could be used more widely to structure discussions of research evidence between researchers, community organizations, and other nonresearch partners. All members of our collaboration found the framework helpful. Community partners appreciated the rigor it brought to discussion and academic partners appreciated how it allowed community insight to be brought together with research evidence in a structured way. The frameworks also allow a layered approach to presenting recommendations, with Fig. 1 being the top level, Tables 4 and 5 being the next, and the full frameworks at https://www.collaborationforchange.co.uk providing complete details for those who need it.

4.1. Limitations and challenges

Although we felt that the process of using Evidence to Decision frameworks went well, the work was done in the context a short 4-month project in the summer of 2021, while the COVID-19 pandemic remained a serious concern. This restricted our ability to schedule meetings at times that worked best for our whole collaboration. Moreover, both community and academic partners were affected by other COVID-related pressures, which may have limited the time they had to contribute to discussions,

Table 5. Recommendations linked to *Trusted messengers, Tailoring the message,* and *Flexible venues and times* as strategies to increase uptake of the COVID-19 vaccine by ethnic minority individuals. The full Evidence to Decision frameworks including evidence summaries, discussion summary, recommendation justification, subgroup considerations, implementation considerations, monitoring and evaluation considerations, and research priorities are at ReShare, the UK Data Service data repository [5] and www.collaborationforchange.co.uk

Strategy	Recommendation
Trusted messengers	Based on evidence from the United Kingdom and the United States, plus our own experience, we recommend the use of a trusted messenger to deliver public health messages on the COVID-19 vaccine. The choice of trusted messenger is nontrivial, and care is needed to ensure that these individuals do indeed have the trust of the community and provide information that is accurate.
Tailoring the message	Based on evidence from the United Kingdom and the United States, plus our own experience, we recommend the use of tailored messaging to deliver public health messages on the COVID-19 vaccine. Tailoring is not just about choice of which languages are used to communicate, but about usage of culturally appropriate, jargon-free, and accessible language that addresses questions and issues that are relevant to the individuals targeted by the message. Tailoring also includes whether to deliver the information in written or oral formats. Messaging needs to take account of information coming from countries outside the United Kingdom. This is because family and other ties make non-UK information more influential for ethnic minority communities than for the majority population.
Flexible venues and times	Based on evidence from the United Kingdom, plus our own experience, we recommend the use of flexible venues and/or appointment times for offering COVID-19 vaccinations to ethnic minority communities. The type of flexibility required will vary by ethnic group.

Fig. 1. The key take-home messages from the collaboration for change work on COVID-19 vaccine uptake by ethnic minority individuals.

or reflect on them. Although all drafts of all frameworks were circulated for comment to our full collaboration, it is possible that working to a different timetable and outside the context of a pandemic may have led to some different findings. That said, we are confident that the headline factors and strategies we identified would not change. Other work [15−17] has also found that trust (especially), information, and accessibility are important factors affecting vaccine uptake by ethnic minority people. Moreover, although we did not use GRADE to assess the certainty of evidence for our mix of qualitative survey and experimental evidence, we do think our use of the framework was in line with the structured and flexible approach to collectively reaching evidence-informed judgments about what to recommend promoted by those who developed the Evidence to Decision frameworks [7,14].

Achieving implementation of our recommendations has been challenging. Despite media interest in 2021 and meetings with local councils and policymakers to discuss the recommendations, most notably with the United Kingdom's Parliamentary Under-Secretary of State for Vaccines and Public Health in February 2022, it remains somewhat unclear to what extent the recommendations have influenced those tasked with implementing vaccine programs.

The work is cited by Public Health Scotland's '*Factors affecting uptake of the COVID-19 vaccine*' report published in June 2022 [18] and presents recommendations in line with ours for increasing vaccine uptake by ethnic minority people. Public Health Scotland and the Scottish Government have continued to stay engaged. Having policymakers at the table during our Evidence to Decision framework discussions may have improved implementation, although the speed with which we had to plan, submit, and do this project effectively ruled this out for us in 2021. Published vaccination rates for England between December 2020 and March 2023 show continued and substantial differences in uptake across ethnic groups [4]. Our findings, and evidence that has accumulated since our work was done, need to be actively implemented by vaccine services if these differences are to be reduced.

We will end our paper by quoting text from our community partners, which forms part of a recommendation linked to trust (Table 4). We think it is worth quoting because it neatly captures the spirit of all our recommendations and, importantly for this paper, the process we used to reach them:

> 'There has been a historical neglect of engagement with ethnic minority communities by organizations such as government, local authorities, the NHS [National Health Service], and public health. For vaccine uptake to increase and be sustained, this has to change. Members of ethnic minority communities must be involved in the design, planning, and delivery of the strategies we identify if those strategies are to be successful.'

CRediT authorship contribution statement

Shaun Treweek: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Writing − original draft, Writing − review & editing. **Miriam Brazzelli:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Writing − review & editing. **Annette Crosse:** Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Writing − review & editing. **Sunil Daga:** Investigation, Methodology, Writing − review & editing. **Talia Isaacs:** Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Resources, Writing − review & editing. **Ria Sunga:** Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Writing − review & editing.

Data availability

All data used in the work are available publicly or in supplementary material.

Declaration of competing interest

None. The GRADE Working Group was not involved with the work described in this article.

Acknowledgments

The Health Services Research Unit, University of Aberdeen, receives core funding from the Chief Scientist Office of the Scottish Government Health Directorates.

Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jclinepi.2024.111268.

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