



Original Research

'I don't want my son to be part of a giant experiment': public attitudes towards COVID-19 vaccines in children

S.N. Williams ^{a, b, *}^a Centre for People and Organisation, School of Management, Swansea University, Swansea, SA1 8EN, UK^b Department of Medical Social Sciences, Feinberg School of Medicine, Northwestern University, Chicago, IL 60611, USA

ARTICLE INFO

Article history:

Received 11 September 2021

Received in revised form

14 January 2022

Accepted 18 January 2022

Available online 24 January 2022

Keywords:

COVID-19

Public attitudes

Qualitative

Vaccine hesitancy

Vaccine uptake

ABSTRACT

Objectives: This qualitative study explored public attitudes to COVID-19 vaccines in children, including reasons for support or opposition to them.

Study design: This was a qualitative study using online focus groups and interviews.

Methods: Group and individual online interviews were conducted with a diverse sample of 24 adults in the United Kingdom to explore their views on the issue of COVID-19 vaccination in children. Data were analysed using a framework approach.

Results: COVID-19 vaccination in children was framed as a complex problem (a 'minefield'). Six themes emerged to explain participants views: (1) uncertainty over whether children can catch, transmit or be severely harmed by COVID-19; (2) lower risk tolerance for unknown longer term effects of the vaccine in children; (3) association of the vaccine programme with government's handling of the pandemic; (4) local social norms as a driver of hesitancy; (5) vaccinating children as a way to protect vulnerable adults; and (6) children's vaccination as parental choice.

Conclusions: COVID-19 vaccination in children is perceived by members of the public as a complex issue, and many are torn or hesitant about the idea. Public health communications will need to combat this hesitancy if vaccine uptake for children is to be pursued as a public health policy.

© 2022 The Royal Society for Public Health. Published by Elsevier Ltd. All rights reserved.

Introduction

The question of whether to vaccinate children against COVID-19 remains a controversial issue globally, with no current consensus in the public health community.¹ Many public health opinion articles have tended to focus on mandatory vaccination in children, despite mandating being unlikely or even counter productive.^{2–4} However, many of the arguments raised are also relevant for optional vaccination in children. Arguments that have been made in favour include a potential contribution to overall population ('herd') immunity, preventing rare but severe disease in children, reducing transmission from children to adults, priming children's immune response to future (re-)infection and helping to keep schools open.² Arguments made against tend to focus on the fact that children are significantly less prone to serious outcomes from COVID-19 and that it is necessary to obtain substantial safety data before widespread use amongst (non-clinically vulnerable) children.³ The level

of public acceptability of COVID-19 vaccines in children is a key criterion that determines eventual uptake.⁵

Findings from public opinion surveys are mixed, with little consensus over the level of support for COVID-19 vaccinations in children.^{6–8} Surveys have begun to explore reasons behind public attitudes to COVID-19 vaccines in children, with the most common reasons in support including to prevent the spread of COVID-19 or to prevent their children from catching COVID-19, and the most common reasons against include concerns over long-term side-effects and the belief that children are unlikely to get very ill from COVID-19.⁸ There is a dearth of qualitative research on public attitudes to COVID vaccines in children. However, qualitative research has explored hesitancy around vaccinations in children generally (i.e. not specifically related to COVID-19) have found that it is a complex decision affected by a range of factors, including experiences, emotions, routine ways of thinking, information sources, peers/family, risk perceptions and trust.⁹ Also, research is starting to emerge on COVID-19 vaccine attitudes in adults – with views falling on a 'continuum of vaccine hesitancy', from full acceptance though to refusal.¹⁰ In a previous study, we found that decisions

* Tel.: +44 7979373823.

E-mail address: s.n.williams@swansea.ac.uk.

concerning COVID-19 adult vaccinations were influenced by a number of facilitators, including an emergent social norm around vaccination and the perceived ‘need’ for vaccines to end the pandemic, and barriers, including concerns over side-effects and a preference for ‘natural immunity’.¹¹ This article explores the participants’ attitudes towards COVID-19 vaccination in children, including the reasons behind their views.

Methods

Sample and recruitment

Participants were recruited as part of the qualitative component of an ongoing, longitudinal mixed methods study exploring public views on the COVID-19 pandemic in the United Kingdom. More details about the methodology can be found in previous publications.^{12–14} In this article, we report on data from a rapid round of four focus groups and three one-to-one interviews with a total of 24 participants. The study was initially designed as a focus group study. However, the decision to include three individual interviews was made on pragmatic grounds (where participants were either the only ones to turn up to a given focus group or contacted the researcher after focus groups had been conducted expressing an interest to still take part).

Data were collected between 1 July and 25 July 2021. At the time in the United Kingdom, the Joint Committee on Vaccination and Immunisation released an official recommendation on 19 July that COVID-19 vaccinations should be offered only to children aged ≥ 12 years with certain underlying health conditions, and not to all children aged 12–15 years.¹⁵ This decision prompted much debate in the scientific community, given a number of countries, such as the United States, for example, had already approved the vaccine for general use in 12 to 15-year-olds.¹⁶

Participants were initially recruited to the full study from March to July 2020 and were all UK-based adults aged ≥ 18 years. Recruitment for the study took place via a combination of social media advertising and snowball recruitment (e.g. Facebook advertisements, online free advertisements, and Twitter). Purposive sampling was used to seek as diverse a range of ages, genders, race/ethnicities, UK locations, and social backgrounds as possible, although the limitations of the final sample are discussed below as well as in previous publications.^{12–14} Full demographic summary details are provided in Table 1.

Participants who had signed up for the full study were invited to take part in focus groups and interviews as a rapid response to the issue of vaccinations in children (a topic preset by the researcher). All focus groups had an average of five participants per group, and focus groups and interviews took place remotely via videoconferencing (Zoom) and lasted approximately 1 h. All participants gave verbal and written consent to be recorded, and audio recordings were then anonymised transcribed. The final sample size was determined largely because of opportunity sampling from the main participant pool for the full study (all 24 participants who responded to the recruitment email for the present study were included). Despite the fact that only 24 of 57 total participants in the participant pool responded to the recruitment email for the present study (in part due to the time sensitive nature of the study and the need to conduct focus groups at short notice), as Table 1 shows, the final sample was diverse. Questions were guided by a semistructured schedule built around the research question and literature mentioned previously, particularly focused on participants’ reasons for their views on whether or not they were favourable towards COVID-19 vaccination in children. Sample questions included ‘do you think children should be offered the COVID-19 vaccine?’ What, if any, concerns do you have about

Table 1
Demographic characteristics for participants in this report.

Characteristic	n (%)
<i>Gender</i>	
Female	10 (42)
Male	14 (58)
<i>Age range</i>	
20s	8 (33)
30s	7 (29)
40+	8 (33)
Did not say	1 (05)
<i>Ethnicity</i>	
White	13 (54)
BAME (Black and Asian Minority Ethnic)	11 (46)
<i>Has child/ren</i>	
Yes	7 (29)
No	17 (71)
<i>Own vaccination status/intention^a</i>	
Vaccinated	19 (79)
Not vaccinated	4 (17)
Undisclosed	1 (04)

^a Vaccination status intention was coded as two groups: (1) ‘vaccinated’ (i.e. those who had received at least one dose of a vaccine at the time of data collection); (2) ‘Not vaccinated’ (those who at the time of data collection had not received at least one dose of a vaccine at the time of data collection; NB: all participants in the sample had received an offer for a first dose by the time of data collection).

vaccinating children for COVID-19 and what are the reasons for these concerns? Ethical approval was granted by (anonymised for peer review) research ethics committees, and all participants gave informed written consent and had their data anonymised.

Data were analysed in accordance with a framework analysis approach.¹⁷ Analysis followed the five main stages of the framework approach: data familiarisation (reading/re-reading transcripts), identifying key themes or codes in initial transcripts, indexing (identifying consistencies and applying codes across transcripts), charting (drawing up a visual data matrix of themes across transcripts), and data mapping (interpretation of the themes matrix).¹⁷ Analysis followed the coding was performed using NVivo (version 11.4.3, QRS).

Results

COVID-19 vaccination in children as a ‘minefield’

Overall, the issue of COVID-19 vaccination in children was framed as a complex issue. Although there was a spectrum of views represented, few participants were unequivocally in favour of COVID-19 vaccination for children. Those with relatively few reservations tended to be non-parents who argued they had less ‘stake’ in the issue and that they would support vaccination in children only if it had been approved as safe. All parents ($n = 7$) in our study expressed hesitancy and concerns, with one stating outright they did not agree with vaccinating children against COVID-19. However, most participants framed the issue as ‘tricky’, ‘a grey area’ or a ‘minefield’:

I just think it's a grey area. I can't really decide which way is best to be honest, there's like pros and cons to each side ... I'm unsure on the whole matter. I think it's a minefield. [Participant 1, male, 30s, non-parent, vaccinated]

Six themes emerged to explain participants’ views: (1) Uncertainty over whether children can catch, transmit or be severely harmed by COVID-19; (2) lower risk tolerance for unknown longer term effects of the vaccine in children; (3) Association of the vaccine programme with government’s handling of the pandemic; (4) Local social norms as a driver of hesitancy; (5) Vaccinating children as a

way to protect vulnerable adults; (6) Children's vaccination as parental choice. Participants tended to weigh up these factors simultaneously and struggled to disentangle them to provide a definitive answer as to whether or not children should be offered a vaccine.

Uncertainty over whether children can catch, transmit or be severely harmed by COVID-19

One prominent theme concerned participants' uncertainty over the extent to which children could either themselves catch, suffer from, and transmit COVID-19:

It's a tricky one. I think there's so much like discrepancy on that the data with COVID in children ... I still don't even know like when I'm teaching if kids are spreading the virus. [Participant 3, male, 20s, non-parent, not vaccinated]

This led to some to argue that because of this uncertainty, they were not sure if vaccinations were necessary or that more time was needed to see exactly how the virus (including new variants) was impacting children:

It feels like is it necessary for them, when it's not initially affecting children. But then you have got this delta variant which does seem to be have more children testing positive. ... It's hard because you feel like you need a bit of time to see. [Participant 8, female, 30s, parent, vaccinated]

Those who were more opposed to vaccination in children were more likely to emphasise that COVID-19 was something that children were not at high risk of dying from or being 'severely impacted biologically' (Participant 10, male, 20s, non-parent, not vaccinated) or were even 'prone to' (Participant 11, female, 30s, parent, not vaccinated). They also emphasised that because children had 'young' and healthy immune systems they were more able to fight the virus 'naturally':

When you are young natural immune system is really strong ... and that if you take care of your lifestyle and eat healthy that should, for now be sufficient than actually going for this jab. [Participant 9, male, 40+, non-parent, vaccinated]

Some participants were inclined to be more favourable to the idea of vaccinating older children ('teenagers') because they felt they were more likely to transmit the disease compared to younger children ('they are out and about a bit more' [Participant 4, male, 40+, non-parent, vaccinated]) and they thought there was 'more evidence they spread the virus' (compared with younger children; Participant 3, male, 20s, non-parent, not vaccinated).

Lower risk tolerance for unknown longer term effects of the vaccine in children

Many participants were 'apprehensive ... that the risks of the vaccine are possibly higher than the risks of them if they were to have Covid' (Participant 8, female, 30s, parent, vaccinated). Parents in particular seemed to have a lower risk tolerance for vaccines in children compared with in adults, with this apprehension being due largely to concerns over potential and unknown future side-effects:

Although I have been vaccinated, I wouldn't want my son to be vaccinated. Although there has been research done, I know it is quite early days, so I would rather take the risk of him getting Covid than the risk of him having the vaccine ... I still feel that some point

in the future they will discover something [about the vaccine] that affects children more than adults. [Participant 15, female, 40+, parent, vaccinated]

Although as described previously, participants tended to feel children were *less* biologically susceptible to the virus because of their young body and immune system, some felt that they were potentially *more* biologically susceptible to any potential adverse side-effects of the vaccine precisely because their body was young and still developing:

I don't think there is a need for any type of fluid going into a child's body. ... Because even with adults, the side effects you've noticed from taking the vaccine and children are more vulnerable and more [at] risk. [Participant 2, male, 30s, non-parent, vaccinated]

As with the previous theme, participants focused on the need for more clarity or evidence:

There is not enough data to show how effective the vaccines are for children or what the implications may be and so maybe waiting for more government information and scientific data to backup that it's important that children get vaccinated before we make these decisions. [Participant 20, female, 30s, parent, vaccinated]

Participants tended to emphasise that the vaccines, in their view, had not been 'fully tested at the moment' (Participant 6, male, 40s, parent, vaccinated). As one parent put it: 'I don't want my son to be part of a giant experiment' (Participant 15, female, 40+, parent, vaccinated).

Local social norms as a driver of hesitancy

Social norms, particularly local social norms (i.e. the views and beliefs of immediate network of family, friends and close others) appeared to strongly influence participants' views:

Speaking to friends with children we seem to all feel similar. We wouldn't want our children to be vaccinated, because we feel that if they get Covid hopefully they won't be too ill. [Participant 15, female, 40+, parent, vaccinated]

I have a young nephew ... and the consensus in our family is that no he shouldn't have it [the vaccine], and the consensus amongst friends who have children is also hesitancy to do this ... Its far too early. [Participant 13, male, 40s, non-parent, vaccinated]

These social norms often related to the factors discussed previously – uncertainty around COVID-19 in children ('hopefully they won't be too ill') and lower risk tolerance for unknown longer term effects ('it's far too early'). Participants also felt that there was or would be a wider social norm around hesitancy or even opposition towards vaccination in children:

I think a lot of people would be upset if they started saying you know that our children are going to have their nasal flu jab and we're going to be offering a Covid jab as well in schools. [Participant 3, male, 20s, non-parent, not vaccinated]

Association of the vaccine programme with government's handling of the pandemic

A number of participants, particularly those more hesitant to the idea of vaccines in children, tended to frame their views in relation

to what they saw as a lack of trust or confidence in the (UK) government's handling of the pandemic:

How can you trust the government or how much confidence do the public have with the government, now that the damage has been done, how can the public restore confidence ... are parents prepared to take a risk for their own children? [Participant 2, male, 30s, non-parent, vaccinated]

One particular concern was over how a vaccination programme would be implemented and whether it would be handled poorly as had been, in their view, the contact tracing and testing programmes in schools:

If they [the government] were having to vaccinate children, they were planning to do some kind of rollout of testing in schools, but they couldn't even organise that. Like it was literally left up to schools ... I think it does come back down to that all of the systems that are in place are really shoddy and like test and trace we know, has been proven it doesn't work they spent billions [of pounds] on it ... it ultimately comes down to trust. [Participant 3, male, 20s, non-parent, not vaccinated]

Vaccinating children as a way to protect society (as collective responsibility)

Some participants argued that vaccinating children might be beneficial to society by contributing to the overall population ('herd') immunity. Only one parent discussed this theme but acknowledged being torn when it came to their own children:

It's important to do what we can to get out of the pandemic situation but it's much harder when it's your children. I have very mixed feelings about it. [Participant 8, female, 30s, parent, vaccinated]

Other participants tended to frame vaccination as a way of protecting transmission to the more vulnerable in society, including their grandparents, thereby implying that they felt that although children may not 'suffer' from COVID-19, they can spread it nonetheless:

I think it would be a good idea to vaccinate children. I know they say children don't suffer so much when they get the virus if they catch it, but then to me it's who they interact with at the end of the day, so you know they are going to go home to their parents who then go to work for example, or they are going to see their grandparents – and so to me I would be better if it was rolled out to try and flatten it down as much as possible. [Participant 4, male, 40+, non-parent, vaccinated]

These participants were mostly non-parents who caveated their views by emphasising that they themselves were not parents and as such stated or implied that they had less say (or stake) in the decision.

Children's vaccination as parental choice (as individual responsibility)

Hesitancy around whether or not children should be vaccinated was often framed in terms of vaccination as an individual choice – in this instance, the choice of the individual parents. Those without children often suggested they felt they were 'not in a position to

comment or judge' (Participant 1, male, 30s, non-parent, vaccinated) and that 'it's better to leave this decision to those who have children I think' (Participant 19, male, 20s, non-parent, vaccinated). Participants acknowledged that there was a lot of responsibility for parents in making the decision, implying that a 'wrong' decision could be costly:

It is quite concerning when it's your children you are responsible for their health and want the best for them – and you don't want to make the wrong decision for them. [Participant 5, female, 20s, non-parent, vaccinated]

One distinction that some participants made was between the ability of older children ('teenagers') to be able to make more informed decisions for themselves, compared with younger children who were too young to understand the issue:

It comes down to people's perception of like, you know, they are children and they can't make decisions and the parents have to make decisions on whether they want to or not, whereas teenagers actually can form their own decision. [Participant 3, male, 20s, non-parent, not vaccinated]

Discussion

This study found that participants framed COVID-19 vaccination in children as a complex issue, or 'minefield'. Although a spectrum of views was found, most participants tended to be uncertain or hesitant about the idea, concluding that there was no straightforward answer. This corresponds with broader research on vaccine attitudes, which suggests that hesitancy is a nuanced concept, and one which occurs on a spectrum (and that hesitancy should not be conflated with opposition or 'anti-vax' sentiment).^{10,18} Findings also provide some context and nuance to existing surveys, which, overall, suggest that there is a significant proportion of people, including parents, who remain uncertain as to whether children should be given a COVID-19 vaccine.^{6–8}

Six main themes, or factors, shaping public attitudes to COVID-19 vaccines were identified. First, there was uncertainty over whether children can catch, transmit or be severely harmed by COVID-19. This uncertainty partly reflected genuine scientific uncertainty that still exists, particularly around children's role in transmission¹⁹ but also may have been compounded by the confusion caused by changing messages and policies they experienced (e.g. around school testing and isolation policies). Existing research suggests that the perception of mixed messages can have a negative effect on pandemic mitigation measures.¹⁴ In the face of such uncertainty, participants tended to couch their views in affective terms (of a 'feeling' they had).²⁰ Second, there was generally a lower risk tolerance for unknown longer term effects of the vaccine in children. Whereas participants generally felt children were less susceptible to COVID-19, they felt they were more susceptible to long-term potential side-effects of the vaccine compared with adults. Parents suggested that they needed to see more evidence of testing and safety in children in order to feel confident. Thirdly, local social norms were a driver of hesitancy. Research suggests that social norms play a significant role in adherence to COVID-19 health behaviours,²¹ including vaccine uptake.²² Participants were strongly influenced by their own social networks, including for parents, other parents, where for many, there is currently a culture of hesitancy around vaccination for COVID-19 in children. Fourth, participants views were often framed in terms of trust in government;

specifically, the extent to which they felt that the UK government could be trusted to successfully extend the vaccination programme to children (based on what they perceived as past failures over, for example, contact tracing). Lack of trust or confidence in government has been shown to be a big predictor of adherence to COVID-19 mitigation measures.^{14,23} Fifth, those who were more in favour tended to emphasise the potential role of COVID-19 vaccines for children in reducing overall infection rates, possibly by bringing up population ('herd') immunity. In this sense, individual vaccinations were framed as a collective act – in line with a common justification of adult vaccination.^{13,24} Conversely, many participants also framed children's vaccination as one of individual choice and responsibility. Non-parents tended to emphasise that the overall issue of whether vaccination should be made available for children was one that parents had a greater say or stake in. Parents tended to emphasise how difficult the issue was and how much responsibility they felt over the potential decision of whether or not they would have their child vaccinated. Thus, many may have a lower risk tolerance, meaning that even those parents very accepting of vaccination in adults were more undecided or hesitant over whether vaccination in children was currently desirable.

As with all qualitative studies, the generalizability of the findings is limited. In addition, because of the rapid nature of the call for participation from the participant pool, the sample size was smaller than in previous rounds of data collection – although the total sample was deemed sufficient for the purposes of the analysis. Also, because of the pragmatic decision to include a small number of interviews, saturation of themes may not have occurred here. A larger number of one-to-one interviews might have explored themes that did not emerge in the group setting (perhaps due to desirability or conformity bias). Future research plans to follow ongoing views on this topic, and more one-to-one interviews will be considered.

There are a number of potential policy implications of this study. For example, many countries are yet to offer COVID-19 vaccines to children (including in the United Kingdom to all 5- to 11-year olds). If high uptake amongst children is deemed by a country's public health policymakers to be important to contribute to a reduction of COVID-19 rates or keep the virus 'under control', then it is important for the reasons for hesitancy to be better understood – particularly amongst parents as key stakeholders. To improve uptake, public health authorities need to ensure clear public communication that emphasises that vaccines have strong scientific evidence to suggest they are safe and effective in children (as demonstrated by a growing number of global childhood vaccinations) and that vaccines are developed by scientific and medical research (i.e. should not be seen as 'political'). Also, uptake might be improved by emphasising the collective benefits that vaccination can have (even where the vaccinated person – e.g. most children – is at relatively low individual risk of serious outcomes). The value of emphasising the collective, 'greater good' in COVID-19 policies have been found elsewhere, for example, contact tracing and isolation.¹³ Finally, it is important for public health to recognise that not all members of the public, including parents, are supportive of COVID-19 vaccinations in children, and recognising it as an act that is of collective significance (e.g. to help 'protect vulnerable adults') but which is fundamentally seen as a 'personal choice'; as research on attitudes towards adult vaccinations have shown, any measures or messages that are perceived to be too strong or are perceived to infringe too greatly on individual choice could ultimately prove counter productive.²⁵

It is important to note that the science of COVID-19 vaccines is rapidly evolving,¹ and public attitudes are doing so with them – social norms around vaccination in children is variable across countries and over time and that additional research will be needed to explore any future attitudinal changes.

Author statements

Acknowledgements

The author is grateful to the participants of the study as well as to Dr Kimberly Dienes, Dr Tova Tampe and Professor Christopher Armitage for their conversations and contributions to the wider research on public attitudes towards COVID-19 policies.

Ethical approval

Ethical approval was received by Swansea University's School of Management Research Ethics Committee.

Funding

This research was supported by the Manchester Centre for Health Psychology based at the University of Manchester and Swansea University's 'Greatest Need Fund'.

Competing interests

The author is currently funded by and collaborating with Public Health Wales for a separate project. The funders had no involvement in the current project or article. The author has no other conflicts of interest to declare.

References

- Ledford H. Should children get COVID vaccines? What the science says. *Nature* 2021;**595**:638–9.
- Plotkin S, Levy P. Considering mandatory vaccination of children for COVID-19. *Pediatrics* 2021;**147**:e2021050531.
- Velavan TP, Pollard AJ, Kreamsner PG. Herd immunity and vaccination of children for COVID-19. *Int J Infect Dis* 2020;**98**:14–5.
- Gostin LO, Salmon DA, Larson HJ. Mandating COVID-19 vaccines. *JAMA* 2021;**325**(6):532–3.
- Opel DJ, Diekema DS, Ross LF. Should we mandate a COVID-19 vaccine for children? *JAMA Pediatr* 2021;**175**(2):125–6.
- IPSOS MORI. 3 in 4 Britons support offering children the vaccine. 2021. <https://www.ipsos.com/ipsos-mori/en-uk/3-4-britons-support-offering-children-vaccine>. [Accessed 27 July 2021].
- Nolsoe E. By 53% to 18%, parents with underage children say they would get them vaccinated against COVID-19. YouGov 2021. Available at: <https://yougov.co.uk/topics/health/articles-reports/2021/07/05/53-18-parents-underage-children-say-they-would-get>. [Accessed 21 July 2021].
- Office of National Statistics (ONS). COVID-19 schools infection survey: England, Round 5. May 2021. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/covid19schoolsinfectionsurveyengland/round5englandmay2021>. [Accessed 21 July 2021].
- Dubé E, Gagnon D, MacDonald N, Bocquier A, Peretti-Watel P, Verger P. Underlying factors impacting vaccine hesitancy in high income countries: a review of qualitative studies. *Expert Rev Vaccine* 2018;**17**(11):989–1004.
- Burgess RA, Osborne RH, Yongabi KA, Greenhalgh T, Gurdasani D, Kang G, et al. The COVID-19 vaccines rush: participatory community engagement matters more than ever. *Lancet* 2021;**397**(10268):8–10.
- Williams SN, Dienes K. Public attitudes to COVID-19 vaccines: a qualitative study. *medRxiv* 2021;**5**(17):21257092.
- Williams SN, Armitage CJ, Tampe T, Dienes K. Public perceptions and experiences of social distancing and social isolation during the COVID-19 pandemic: a UK-based focus group study. *BMJ Open* 2020;**10**:e039334.
- Williams SN, Armitage CJ, Tampe T, Dienes K. Public attitudes towards COVID-19 contact tracing apps: a UK-based focus group study. *Health Expect* 2020;**24**:337–85. 2020.
- Williams SN, Armitage CJ, Tampe T, Dienes K. Public perceptions of non-adherence to COVID-19 measures by self and others in the United Kingdom. *PLoS One* 2021;**16**(10):e0258781. <https://doi.org/10.1371/journal.pone.0258781>.
- Joint Committee on Vaccination and Immunisation (UK). JCVI statement on COVID-19 vaccination of children and young people aged 12 to 17 years: 15 July 2021. Available at: <https://www.gov.uk/government/publications/covid-19-vaccination-of-children-and-young-people-aged-12-to-17-years-jcvi-statement/jcvi-statement-on-covid-19-vaccination-of-children-and-young-people-aged-12-to-17-years-15-july-2021>. [Accessed 10 January 2022].

16. Helmore E. US authorizes Pfizer coronavirus vaccine for children ages 12 to 15. *The Guardian* 10th May 2021. Available at: <https://www.theguardian.com/world/2021/may/10/pfizer-vaccine-fda-authorized-children-12-15>. [Accessed 10 January 2022].
17. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol* 2013;**13**:1–8.
18. World Health Organization. SAGE (the Strategic Advisory group of Experts). Report of the SAGE working group on vaccine hesitancy. SAGE REPORT, October, 63.2014. https://www.who.int/immunization/sage/meetings/2014/october/1_Report_WORKING_GROUP_vaccine_hesitancy_final.pdf.
19. Fischer A. Resistance of children to covid-19. How? *Mucosal Immunol* 2020;**13**:563–5.
20. Slovic P, Finucane ML, Peters E, MacGregor DG. Risk as analysis and risk as feelings: some thoughts about affect, reason, risk, and rationality. *Risk Anal* 2004;**24**:311–22. <https://doi.org/10.1111/j.0272-4332.2004.00433.x>.
21. van Bavel J, Baicker K, Boggio PS, Capraro V, Chiockoa A, Cikara M, et al. Using social and behavioural science to support COVID-19 pandemic response. *Nat Hum Behav* 2020;**4**:460–71.
22. Graupensperger S, Abdallah D, Lee C. Social norms and vaccine uptake: college students vaccination intentions, attitudes, and estimated peer norms and comparisons with influenza vaccine. *Vaccine* 2021;**39**:2060–7.
23. Wright L, Steptoe A, Fancourt D. Predictors of self-reported adherence to COVID-19 guidelines. A longitudinal observational study of 51,600 UK adults. *Lancet Reg Health Eur* 2021;**4**:100061.
24. Wakefield J, Khauser A. Doing it for us: community identification predicts willingness to receive a COVID-19 vaccination via perceived sense of duty to the community. *J Commun Appl Soc Psychol* 2021;**31**:603–14.
25. de Figueiredo A, Larsen H, Reicher S. The potential impact of vaccine passports on inclination to accept COVID-19 vaccinations in the United Kingdom: evidence from a large cross-sectional survey and modeling study. *Eclinical Med* 2021;**40**:101109.