

RESEARCH LETTER

Inadequate intention to receive Covid-19 vaccination: indicators for public health messaging needed to improve uptake in UK

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Abstract

Data promising effective Covid-19 vaccines have accelerated the UK's mass vaccination programme. The UK public's attitudes to the government's prioritisation list are unknown, and achieving critical population immunity will require the remaining majority to accept both vaccination and the delay in access of up to a year or more. This cross-sectional observational study sent an online questionnaire to registrants of the UK National Health Service's largest personal health record. Question items covered willingness for Covid-19 vaccine uptake and attitudes to prioritisation. Among 9,122 responses, 71.5% indicated wanting a vaccine, below what previous modelling indicated as critical levels for progressing towards herd immunity. 22.7% disagreed with the prioritisation list, though 70.3% were against being able to expedite vaccination through payment. Age and female gender were, respectively, strongly positively and negatively associated with wanting a vaccine. Teachers and Black, Asian and Minority Ethnic (BAME) groups were most cited by respondents for prioritisation. This study identifies factors to inform the public health messaging critical to improving uptake.

Introduction

Data promising effective Covid-19 vaccines has accelerated the UK's mass vaccination programme. The UK government's prioritisation list is based only on age, care-home residency, preexisting disease, and health and care worker status.¹ But achieving the critical level of population immunity will require the remaining majority to accept both vaccination and the delay of up to a year or more² in them receiving it if an adequate level of immunity is to be achieved.³ The public's perception of who should be prioritised beyond the current list remains unknown but could inform health policy that builds public trust by considering these preferences.

Methods

This study was approved by the Institutional Review Board of Imperial College Healthcare National Health Service (NHS) Trust (ICHNT). Participants were informed their data would be anonymised for analysis and were free to opt out. We used the NHS's largest personal health record, the nationwide ICHNT Care Information Exchange (CIE)⁴, to determine attitudes to the government's prioritisation list, following the announcement of the second effective vaccine. CIE registrants were sent an email notification to complete a questionnaire within their record (13th November 2020).

Question items determined intent to receive a Covid-19 vaccine in order to refine established modelling³ of the target metrics for achieving herd immunity. Further question items focused on attitudes on the UK government's prioritisation list; and which groups should be prioritised after the initial list has been completed. Descriptive statistics are reported alongside adjusted and unadjusted odds ratios (OR). Free-text analysis and quantification of next-priority groups was performed using natural language processing packages (SpaCy and RegEx) in Python (version 3.7).

Results

Among 9122 respondents (49.4% response rate), 6521 (71.5%) want Covid-19 vaccination, and 880 (9.6%) would refuse. Although 2068 (22.7%) disagree with the government's order of priority, 6416 (70.3%) were against being able to pay for vaccination. In response to the question of which groups should be prioritised, unrestricted free-text responses (7,838) indicated teachers (988, 12.6%), BAME (837, 10.7%), general key workers (807, 10.3%) children (582, 7.4%), and university students (529, 6.7%). 32.6% were concerned that the priority list makes no reference to Black, Asian and Minority Ethnic (BAME) groups (table).

Excluding those uncertain (N = 1678), yearly increase in age (unadjusted-OR: 1.050 (95%CI:1.044-1.055), adjusted-OR: 1.045 (95%CI:1.039-1.050), and female gender (unadjusted-OR 0.415 (95%CI:0.356-0.482), adjusted-OR 0.540 (95%CI:0.461-0.632) strongly increased and decreased vaccine acceptance respectively, such that a yearly increase in age was associated with a 5% increase in likelihood of vaccination. Overall, 64.2% of females would want vaccination and 12.4% would not, compared to 80.8% and 6.5% of males, respectively.

Discussion

Although the duration of individual protection from the UK's now active Covid-19 vaccination programme remains unknown, assuming this to be one year, previous modelling by Anderson et al.³ indicates that our headline finding of 71.5% uptake is inadequate for progressing towards herd immunity. A vaccine with 90% efficacy would require 90% coverage in the first year, increasing to 100% of the population for 80% efficacy or less. Potentially inadequate therefore, we identify factors to inform the public health messaging to improve uptake: younger people and females, in combination most exposed to Covid-19⁵, should be proactively targeted. That 33%

of respondents were concerned that the priority list makes no reference to BAME groups presents a particular challenge to the UK government, which knows this to be a group not only at increased risk but also with established poor uptake of existing vaccination programmes.⁶ Our results indicate not only the priority considerations for public health messaging necessary to increase the inadequate level of intended uptake, but also the public's concern at omission of reference to BAME groups and a preference for extending the prioritisation list to teachers and BAME groups.

Table - Care Information Exchange questionnaire response, November 15th, 2020.

Total N (%)	9122 (100)
Age Mean (SD)	59.7 (13.6)
Age category N (%)	
18-29	173 (1.9)
30-39	749 (8.2)
40-49	1123 (12.3)
50-59	2065 (22.6)
60-69	2606 (28.6)
70-79	2017 (22.1)
80+	389 (4.3)
Gender	
Male	4176 (45.8)
Female	4945 (54.2)
Indeterminate	<5 (0.0)
Ethnicity	
White background	6210 (68.1)
Non-White background	1256 (13.8)
Prefer not to say	86 (0.9)
Missing**	1570 (17.2)
If a COVID-19 vaccine was available, would you want to have it?	
Yes	6521 (71.5)
No - because I believe I have health conditions that make it unsafe	257 (2.8)
No - because I don't believe in vaccination	71 (0.8)
No - because I think I have had COVID-19 infection (but not tested)	88 (1.0)
No - because testing has confirmed I have had COVID-19 infection	68 (0.7)
No - other	396 (4.3)
Not sure	1678 (18.4)
Missing	43 (0.5%)

Do you agree that this order of priorities is correct?*	
Yes	6798 (74.5)
No	2068 (22.7)
Missing	256 (2.8)
Do you think you should be allowed to pay to have a COVID-19 vaccine without delay?	
Yes	2435 (26.7)
No	6416 (70.3)
Missing	271 (3.0)
Number 11 on the government's list is "rest of the population (priority to be determined)". Which groups you think should be prioritised next? Response number (%)***	7838 (100)
Teachers	988 (12.6)
Black, Asian and Minority Ethnic (BAME) Groups	837 (10.7)
Key workers (general)	807 (10.3)
Children	582 (7.4)
University Students	529 (6.7)
Public Transport Workers	441 (5.6)
Hospitality & Retail	278 (3.5)
Other	3376 (43.1)
Are you concerned that the government list makes no direct reference to Black and Asian and Minority Ethnic groups?	
Yes	2971 (32.6)
No	5823 (63.8)
Missing	328 (3.6)

*This question included the UK government's provisional prioritisation list for Covid-19 vaccination for participants to review.

**Ethnicity reported by participants in a previous questionnaire, not completed by 17.2% of participants of the 13th November 2020 questionnaire.

*** Responses analysed in Python (version 3.7). Tokenization using SpaCy's tokenizer followed by rules-based labelling using RegEx and SpaCy's token matcher, with each individual label verified by the authors. Inclusion limited to labels (groups) with >200 responses.

References:

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Author Contribution:

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