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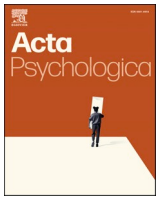

The psychological and behavioural correlates of COVID-19 vaccine hesitancy and resistance in Ireland and the UK

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ABSTRACT

Background: The successful control of the COVID-19 pandemic depends largely on the acceptance and uptake of a COVID-19 vaccine among the public. Thus, formative research aiming to understand and determine the causes of weak and/or positive vaccination intentions is vital in order to ensure the success of future and current vaccination programmes through the provision of effective, evidence-based health messaging.
Methods: A cross-sectional survey was completed by a sample of Irish (N = 500) and UK (N = 579) citizens using the online platform 'Qualtrics'. Participants completed a questionnaire battery comprised of health, attitudes/beliefs, influences, and behavioural intention measures. Demographic information was also assessed.
Results: Results highlighted similar rates of vaccine intention among both samples; where a total of 76.8% Irish respondents, and 73.7% of UK respondents indicated that they intended to be immunized if the government advised them to take the COVID-19 vaccine. Overall, 23.2% of Irish respondents reported being vaccine hesitant or vaccine resistant, while a rate of 26.3% of UK respondents reported vaccine hesitancy or resistance. Univariate analysis highlighted that both gender and age played a significant role in vaccine intention, with women under age 30 reporting higher rate of vaccine hesitancy. Multivariate analysis revealed that significant correlates of vaccine acceptance included peer influence, GP influence, civic responsibility, perceived benefit, and positive vaccination attitudes. Those who reported vaccine resistance and hesitancy were more likely to have less positive vaccination attitudes and perceive higher vaccination risk.
Discussion: The current sociodemographic and psychological profiles of vaccine resistant and hesitant individuals provide a useful resource for informing health practitioners in the UK and Ireland with the means of enhancing pro-vaccine attitudes and promoting vaccination uptake. The current research shows indications of associations between distrust in the vaccine itself and vaccine hesitancy and resistance. Thus, to effectively design and deliver public health messages that ensures the success of vaccination uptake, it is likely that governments and public health officials will need to take actions to garner trust in the safety of the vaccine itself. Additionally, campaigns to decrease hesitancy and resistance in the COVID-19 vaccine may benefit in targeting altruism to increase willingness to get vaccinated against COVID-19.

1. Introduction

The outbreak of COVID-19, a disease caused by coronavirus SARS-CoV-2, emerged from Wuhan, China, in December 2019. It was declared a pandemic by The World Health Organisation (WHO) on 11th March 2020 (Arden & Chilcot, 2020). At the time of writing, globally there have been over 181 million COVID-19 cases and close to 4 million deaths (WHO, 2021). Despite the persistent efforts of physical distancing, shielding and quarantine measures for many countries' citizens, there may be no actual return to pre-pandemic life until wide-reaching vaccination programmes are established.

In early December 2020, the first vaccine from Pfizer-BioNTech was approved for distribution within the UK, and subsequently, both the Oxford AstraZeneca and Moderna vaccines have been approved and introduced into the rollout across the UK. Ireland have approved and distributed vaccines from Pfizer-BioNTech, Moderna and Oxford AstraZeneca since late December 2020. Since the first dose of the COVID-19 vaccine was delivered, the momentum has shifted from securing and producing an effective vaccine to delivering an efficient and wide-reaching vaccination programmes to ensure the scientific efforts

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translate into real-world protection against a disease still rampant across the world. At the time of writing, 54.2% of the population in the UK has been fully vaccinated, and in Ireland 46.4% of the population has been fully vaccinated (HSE, 2021; NHS, 2021), and uptake among priority groups appears exceptionally high (Gaughan, 2021). However, there is still concern over the possibility of hesitancy emerging with the continuing rollout. High vaccine uptake is critical to suppress the pandemic (Bartsch et al., 2020), and the emergence of new variants suggests that to achieve herd immunity the critical threshold percentage may be as high as 90% for combined infection and vaccination (Moore et al., 2021). Since the start of the pandemic, research studies have sought to quantify population vaccine acceptance, with rates ranging between 23% (Kuwait) to 97% (Ecuador) (Sallam, 2021). Studies conducted in the UK have found vaccine acceptance rates between 63%–69% (e.g., Murphy et al., 2021; Paul et al., 2021; Sherman et al., 2021), and between 65%–86.5% in Ireland (Eurofound, 2021; Murphy et al., 2021). To reach population/herd immunity it is important to increase vaccination rates as much as possible. In the absence of mandatory vaccination programmes, public health strategies are required which increase the willingness to get vaccinated (Rieger, 2020).

It is evident from the above cited papers that substantial vaccine hesitancy and resistance exist in the global population. Vaccine hesitancy refers to delay in acceptance or refusal of a vaccine despite its availability compared with vaccine resistance is where one is absolutely against taking a vaccine. It is a complex phenomenon, and varies across time, place, and vaccines (MacDonald & SAGE Working Group on Vaccine Hesitancy, 2015). It is therefore very important to distinguish the psychological processes that characterise and distinguish vaccine hesitant and resistant individuals from those who are receptive to vaccines. Doing so not only helps to account for why vaccine hesitant and resistant individuals come to hold the specific beliefs that they do, but it may also provide an opportunity to tailor public health messages in ways that are consistent with these individuals' psychological dispositions. Therefore, identifying, describing, and understanding who is likely to be vaccine hesitant is of outmost importance, so that public health campaigns and interventions can be targeted for maximum efficiency. While several studies have sought to identify factors associated with COVID-19 vaccine hesitancy, they were conducted prior to the approval of a COVID-19 vaccine. It is not known whether these factors have the same importance when the outcome is real rather than hypothetical. Data for the current study were collected during the vaccine roll-out, and therefore our participants were asked about their intention to accept a COVID vaccine which was likely to be offered soon. Additionally, we focused on psychological process variables using robust theoretical frameworks to guide our study. Further, acknowledging the multiple levels of influence on behaviour, we have included additional variables of interest (e.g., civic responsibility, peer influence) for a more complete understanding of vaccine hesitancy. Hence the aim of this study was to explore factors associated with vaccine hesitancy, vaccine resistance and vaccine acceptance

1.1. Previous research

There is a wealth of research on factors that influence and predict intention to uptake vaccinations. Several social cognitive theories have been applied to this behaviour in previous literature. In particular, the Health Belief Model (HBM; Becker, 1974), the Social Cognitive Theory (Bandura & National Inst of Mental Health, 1986), and the Theory of Planned Behaviour (TPB; Ajzen, 1991), have shown the predictive utility of behavioural attitudes, risk perceptions, and self-efficacy towards vaccinations, including against HPV (e.g., Pot et al., 2017; Priest et al., 2015), influenza (e.g., Corace et al., 2016; Wu et al., 2020), and pandemic swine flu (e.g., Byrne et al., 2012; Myers & Goodwin, 2011).

Since the start of the pandemic and before the availability of a vaccine, several studies have examined COVID-19 vaccine acceptance beliefs and attitudes. For example, Sherman et al. (2021) explored predictors of vaccine acceptance in a large sample of UK adults. Increased likelihood of accepting a hypothetical COVID-19 vaccine was associated with older age, previous vaccination behaviour, greater COVID-19 risk perceptions, more positive vaccination beliefs and attitudes, weaker vaccine risk perception, and better health literacy. While this study is important in understanding psychological and behavioural predictors of vaccine acceptance, it is not clear to what extent these findings can be used to understand vaccine hesitancy. A large cross-sectional survey of UK adults explored the influence of negative general vaccine attitudes and other sociodemographic and psychological variables on vaccine hesitancy and refusal (Paul et al., 2021). Results showed that vaccine hesitancy was associated with female gender, low income, living with children, not having flu vaccine, and poor adherence to COVID government guidelines. Additionally, low trust in authorities and negative vaccine attitudes were also associated with refusal and hesitancy. While this study provides information of correlates of vaccine hesitancy and resistance, the vaccine attitude scale implemented did not ask specifically about a COVID-19 vaccine, instead it focused on general vaccine attitudes. It also did not include other psychological variables known to influence vaccine behaviour, such as HBM constructs (susceptibility, severity, risk, benefit) and TPB constructs (e.g., social norms). A survey of nationally representative samples of the general adult population in Ireland and the UK explored a range of sociodemographic and personality differences between vaccine hesitant, resistant, and accepting respondents (Murphy et al., 2021). Results demonstrated differences with regards to levels of self-interest, trust in authorities, religious beliefs, conspiracy, and paranoid beliefs, as well as differences in thinking styles and personality traits. Likewise, as cited in a report by the International Covid-19 Behavioural Insights and Policy Group (2021); reasons for vaccine acceptance in Ireland include: trust in the efficacy and evidence of clinical testing of the vaccine and protecting oneself and others. According to a study conducted by Muldoon et al. (2021) reasons for vaccine hesitancy and resistance included: fear of side effects and conspiracy beliefs. Sub-groups with a low intention to vaccinate included women and minority groups. Key predictors of positive vaccination intentions included past vaccine uptake; perceived impact of the pandemic on one's nation or community; trust in government, science and healthcare workers; worry or fear of COVID-19; while susceptibility to misinformation was a predictor of negative intentions. Accordingly, the current study aims to incorporate previously examined variables to enhance and support findings from previous studies; as well as to bridge explorative gaps within current literature. In particular, although the research conducted by Murphy et al. (2021) highlights the role of personality variables, it does not include the psychological variables known to influence vaccine behaviour, such as vaccine attitudes and beliefs. Consequently, the current study aims to focus on the impact of attitudes and perceptions on vaccination intention. Additionally, the current research aims to build on the understanding around the role of civic responsibility as a predictor of intention to vaccinate. This is a contemporary addition to the field of vaccine hesitancy, which has been sparsely documented during the COVID-19 pandemic. Despite this, recent research studies have highlighted the importance of including it in future research (Bourgeois et al., 2020). Research conducted by Kwok et al. (2021) explored a similar concept of ‘collective responsibility’, which highlighted a significant association between the variable and greater COVID-19 vaccine acceptance. However, this research was conducted on a socially unrepresentative sample of nurses, who as a professional group have been found to have higher levels of social responsibility due to taught altruism thus limiting the generalizability of results (Mahlin, 2010). Consequently, the current study aims to build on the previous research by expanding the study population and increasing the inter-rater reliability of the findings.

1.2. Current study

Negative attitudes towards vaccinations and hesitancy or unwillingness to vaccinate are major barriers to the full population immunization against COVID-19 (Dror et al., 2020). Elucidating factors associated with vaccine hesitancy about receiving a COVID-19 vaccine is imperative, as individuals who are vaccine hesitant are likely to be the most realistic targets for public health interventions encouraging vaccination (Paul et al., 2021; WHO, 2020).

The present research examines intentions to vaccinate during a declared pandemic, and at the height of the pandemic alert. This improves the validity of findings in that the cross-sectional study was taken at a time when vaccination uptake was being actively advocated by government and health promotion authorities worldwide, and participants were being asked about their genuine intention to uptake vaccination.

The current study sets its focus on the four core components of the HBM model, which underscores the likelihood that a person will engage in a particular health behaviour based on their health beliefs and contains several primary concepts that predict why people will take action to prevent, to screen for, or to control illness conditions; these include perceived susceptibility to and perceived severity of disease; perceived benefits and perceived risks of preventative strategies (e.g., vaccinating) against a disease (Champion & Skinner, 2008).

The basic framework of the model suggests that for successful behavioural change to occur, individuals must feel threatened by their current patterns of behaviour (i.e., perceived susceptibility to and perceived severity of contracting COVID-19) and believe that a specific change in behaviour will result in a valued outcome (i.e., perceived benefit of immunization against COVID-19) that outweigh the anticipated barriers to taking the action (i.e., perceived risks associated with vaccination uptake) (Ayers et al., 2007).

The predictive utility of health belief variables (susceptibility, severity, barriers to vaccination, and benefits of prevention) were examined. The additional value of including other variables identified from previous studies of vaccine hesitancy such as attitudes, fear of Covid-19, trust in authorities, civic responsibilities, adherence to public health guidance, and external influences, were explored which are typically measured in the context of attitude behaviour models, such as the Theory of Reasoned Action (TRA) or the Theory of Planned Behaviour (TPB). Fear of Covid-19 was included as a measure of Covid-specific risk perceptions/attitudes, and is associated with adherence to public health guidance to reduce infection (Alsharawy et al., 2021).

2. Methods

2.1. Participants and design

A cross-sectional internet-based survey was conducted between December 2020 and March 2021 in the UK and Ireland. Participant inclusion criteria included adults over 18 years of age. A sample of 1079 persons from the UK and Ireland (80% female, mean age 36.95, SD = 15.47) were recruited using a number of convenience sampling strategies, including internet and social media outlining purpose and inclusion criteria. There were 579 participants from the UK (54%) and 500 participants from Ireland (46%). Sample size was based on guidelines for multinomial logistic regression which indicate a minimum of 10 cases per independent variable (Schwab, 2002). Participants completed an anonymous, self-administered 15-minute online survey in self-selected locations. All procedures were reviewed and approved by the host universities' ethics committees.

2.2. Procedure

Participants accessed the anonymous survey link which directed them to the Qualtrics survey platform. Informed consent was requested following the information sheet which covered the rationale behind the current research and what the survey would entail. Confidentiality and the voluntary nature of participation were assured, and participants were informed of their right to withdraw from the survey at any time. Once completed the participants finished on a debrief sheet which included helpful links for advice surrounding COVID-19 related stress and anxiety to limit harm to participants.

2.3. Measures

The 70-item questionnaire incorporated elements of the protocol used by Byrne et al. (2012) and assessed behavioural determinants of intention to vaccinate based on components of the HBM and other relevant variables of interest, details of which are provided below.

2.3.1. Outcome measure

The primary outcome was the intention to vaccinate against COVID-19 which was measured by a single item; “If the NHS/HSE advised you to take an available COVID-19 vaccine would you comply?” Respondents had the choice of three options of which to respond *yes* (vaccine accepting), *no* (vaccine resistant), and *unsure* (vaccine hesitant).

2.3.2. Demographic information

The demographic data collected consisted of COVID-19 non-specific information (Age, Gender, Ethnicity, Occupation, and Political orientation) as well as COVID-19 specific information (Vulnerability, Public facing jobs, COVID positive) (Sherman et al., 2021).

2.3.3. Predictor variables

Questions concerning the components from the HBM were based on previous influenza research (Byrne et al., 2012; Zijtregtop et al., 2010), and additional variables measuring attitudes and external influences were also adopted from these sources and modified to relate to COVID-19.

Perceived severity ($\alpha = 0.60$) comprised two items including “I believe that if I was to contract COVID-19 it would have serious consequences to my health”. The response format was a five-point Likert scale from *strongly disagree* (1) to *strongly agree* (5). A higher score indicates greater perceived severity of COVID-19.

Perceived susceptibility was measured with two items that explored respondent's perceived risk of contracting COVID-19; and risk of infecting others if COVID-19 was contracted ($\alpha = 0.45$). The response format was a five-point Likert scale from *strongly disagree* (1) to *strongly agree* (5). A higher score indicates greater perceived susceptibility to COVID-19.

Vaccine benefit ($\alpha = 0.90$) had four questions total “I believe my likelihood of contracting COVID-19 or suffering significantly from the virus would be lessened if I have been vaccinated.” The response format was a five-point Likert scale from *strongly disagree* (1) to *strongly agree* (5). A higher score indicates greater vaccine benefit.

Vaccine risk ($\alpha = 0.81$) contained four items, including “The haste in the production of the COVID-19 vaccines worries me”. The response format was a five-point Likert scale from *strongly disagree* (1) to *strongly agree* (5). A higher score indicates greater vaccine risk.

Vaccine Attitudes ($\alpha = 0.64$) were measured by two items which explored social and personal beliefs encompassing COVID-19 vaccination: if people in my environment get vaccinated, it is unnecessary for me to get vaccinated; and I can protect myself against COVID-19 without getting vaccinated with the pandemic in its current state. The response format for both items were measured on a five-point Likert scale from *strongly disagree* (1) to *strongly agree* (5). A higher score indicates more positive attitudes towards immunization against COVID-19.

Social/External Influences ($\alpha = 0.59$) were assessed by three items to determine the impact of others on one's vaccination intentions. Two items were examined on a 3-point Likert scale more likely, less likely,

and not affected, and one on a five-point Likert scale ranging from (1) not very important to (5) very important. Social influences were measured by responding to influences of the government, the GP, and those close to you on getting vaccinated.

Trust in Authorities (α = 0.73) was examined using items that suggested trust in the government and in the NHS/HSE in providing "the best possible advice regarding my health". Respondents rated their level of agreement with each of the two statements on a scale from 0 to 100, and a mean of both items was calculated and utilized as a measure of 'trust'.

Adherence to COVID-19 guidelines (α = 0.82) was measured using thirteen items that explored respondent's participation in and general compliance to the COVID-19 guidelines recommended and implemented by the HSE. Responses were given on a five-point Likert scale ranging from never (1) to always (5). A higher score indicates more positive adherence to COVID-19 guidelines.

Civic responsibility (α = 0.64) investigated participants response to COVID-19 pertaining the welfare of those around them and their moral responsibility towards their external environment. Three items examined civic responsibility and included taking the COVID-19 vaccine to protect others more so than oneself; having a responsibility to one's community to vaccinate; and if one could not vaccinate, they would want others to vaccinate to help protect oneself. Responses were given on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). In addition, participants were asked whether they believed it was their duty or their choice to follow government-mandated rules during the COVID-19 pandemic. This variable could also be considered as a measure for civic responsibility.

Government response (Lazarus et al., 2020) (α = 0.88) was measured by examining participants opinions on the government's performance during the COVID-19 pandemic using 10-items. Responses were given on a five-point Likert scale ranging from completely disagree (1) to completely agree (5).

Fear of COVID-19 (Ahorsu et al., 2020) (α = 0.85) measured respondents' levels of fear and anxiety surrounding the virus and the worries of contracting it. Sample items include "I am most afraid of coronavirus-19", "When watching news and stories about coronavirus-19 on social media, I become nervous or anxious". Responses were given to 7-items on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5).

Information sourcing of COVID-19 information was a further measure included for the current research as a development from Byrne et al. (2012) due to the media publicity of the current pandemic the measure has been included in contemporary COVID-19 research (Oosterhoff et al., 2020). Battery items examined information sourcing of COVID-19 "Do you actively seek out information regarding COVID-19" which were measured using closed question selection.

2.4. Statistical analyses

All statistical analyses were conducted using IBM SPSS for Windows (version 27). Differences in continuous variables between the vaccine accepting, vaccine resistant and vaccine hesitant groups were analysed using Kruskal–Wallis with a Mann-Whitney U post hoc analysis. The use of non-parametric tests was employed due to violations in the criteria and assumptions of parametric tests. Associations between intention and categorical variables were analysed using chi-square. A series of multinomial logistic regression were then performed to assess the impact of the behavioural determinants on vaccination hesitancy, resistance, and acceptance. As suggested by recent research (i.e., Murphy et al., 2021), relative to vaccine intention, national differences exist between Ireland and the UK; and thus, in addition to analysing the overall sample (N-1079), stratified analysis for both the Irish and UK samples were also conducted. Variables included in each multinomial logistic regression were chosen based on significance in prior analysis.

3. Results

3.1. Prevalence of vaccine acceptance, resistance and hesitancy in Ireland and the UK

Data from samples from both Ireland (N = 500) and the UK (N = 579) were collected, revealing an overall rate of 75.2% vaccine acceptance (N = 811); 10.9% vaccine resistance (N = 118); and 13.9% vaccine hesitancy (N = 150). Results highlighted similar rates among both samples; where a total 76.8% Irish respondents, and 73.7% of UK respondents indicated that they intended to be immunized (vaccine acceptant) if the government advised the uptake of a COVID-19 vaccine. 9.6% of Irish respondents, and 12.1% of UK respondents did not intend to vaccinate (vaccine resistant); and 13.6% of Irish respondents, and 14.2% of UK respondents said they were unsure if they would vaccinate or not (vaccine hesitant). Sociodemographic breakdown of the overall groups can be found in Table 1.

3.2. Sociodemographic and health variables associated with COVID-19 vaccine intention

In the overall sample, chi-square analyses revealed significant associations between intention and: gender $x^2(2) = 9.44$, $p = .009$; ethnicity $x^2(2) = 30.70$, $p < .001$; political orientation $x^2(4) = 10.75$, $p = .03$; actively seeking Covid-19 information $x^2(2) = 49.54$, $p < .001$; information source $x^2(2) = 31.01$, $p < .001$; past flu vaccination $x^2(2) = 67.13$, $p < .001$; present flu vaccination $x^2(4) = 172.40$, $p < .001$; and civic responsibility (duty vs. choice) $x^2(2) = 27.45$, $p < .001$. Further separate analysis of both samples revealed that in the Irish sample, there

Table 1
Sociodemographic characteristics of samples.

Variable	Ireland	UK	Combined sample
	N (%)	N (%)	N (%)
Gender			
Female	386 (77.5)	472 (82.2)	858 (80)
Male	112 (22.5)	102 (17.8)	214 (20)
Age			
30 and under	231 (46.3)	237 (40.9)	468 (43.4)
31 and over	268 (53.7)	342 (59.1)	610 (56.6)
Ethnicity			
White	496 (99.2)	515 (88.9)	1011 (93.7)
BAME	4 (0.8)	64 (11.1)	68 (6.3)
SES			
Higher SES	263 (52.6)	239 (41.6)	502 (45.5)
Lower SES	237 (47.4)	335 (58.4)	577 (53.5)
Political orientation			
Conservative	36 (7.2)	72 (12.7)	108 (10.1)
Middle ground	227 (45.4)	245 (43.3)	472 (44.3)
Liberal	237 (47.4)	249 (44)	486 (45.6)
Health status			
Clinically vulnerable	63 (12.6)	94 (16.9)	179 (16.6)
No underlying illness	437 (87.4)	462 (83.1)	899 (83.4)
Previous COVID infection			
No	449 (89.8)	484 (83.6)	933 (86.5)
Yes	51 (10.2)	95 (16.4)	146 (13.5)
Public facing job			
Yes	271 (54.2)	267 (46.4)	538 (50)
No	229 (945.8)	309 (53.6)	538 (50)
Information seeking			
Yes	369 (73.8)	371 (64.3)	740 (68.70
No	131 (26.2)	206 (35.7)	227 (31.3)
Information source			
Mainstream media	316 (63.2)	389 (67.2)	705 (65.3)
Social media	184 (36.8)	190 (32.8)	374 (34.7)
Past flu vaccination			
Yes	191 (38.2)	297 (51.4)	488 (45.3)
No	309 (61.8)	281 (48.6)	590 (54.7)
Present flu vaccination			
Yes	143 (28.6)	213 (36.8)	356 (33)
No	357 (71.4)	366 (63.2)	723 (67)

were significant associations between intention and: gender $X^2(2) = 7.12$, p = .03; past flu vaccination $X^2(2) = 35.90$, p < .001; present flu vaccination $X^2(2) = 27.45$, p < .001; political orientation $X^2(4) = 10.78$, p = .03; actively seeking covid-19 information $X^2(2) = 18.13$, p < .001; information source $X^2(2) = 8.76$, p = .01; and civic responsibility (duty vs. choice) $X^2(4) = 90.20$, p < .001. In the UK sample, chi-square analyses demonstrated similar observations with significant associations found between intention and: past flu vaccination $X^2(2) = 35.98$, p < .001; present flu vaccination $X^2(2) = 68.56$, p < .001; ethnicity $X^2(2) = 33.53$, p < .001; actively seeking Covid-19 information $X^2(2) = 30.28$, p < .001; information source $X^2(2) = 30.80$, p < .001; and civic responsibility (duty vs. choice) $X^2(4) = 86.69$, p < .001. In the interest of brevity, we only present statistically significant associations; see Tables 2, 3 and 4 for full Chi-square results.

3.3. Psychological and behavioural variables associated with COVID-19 vaccine intention

Results from the Kruskal Wallis reported significant differences between all continuous variables and intention to vaccinate in the overall sample, and in the stratified analyses of the Irish and UK samples. A post hoc Mann-Whitney test was applied to follow up on significant variables using a Bonferroni adjusted alpha level p = .017 (0.05/3). The means, standard deviations, and Cronbach alpha for predictor variables can be found in Tables 5 and 6 and 7.

3.3.1. Age

There was a significant difference in age depending on vaccination intention in both the Irish (H (2) = 22.41, p < .001) and the UK sample (H (2) = 20.42, p < .001). In the Irish sample post hoc examination of group comparisons revealed that vaccine resistant respondents were significantly older vaccine accepting (U = 5616.00, p < .001), and vaccine hesitant respondents (U = 885.50, p < .001). In the UK sample, vaccine accepting responders were significantly older than vaccine hesitant (U = 12,420.50, p < .001), and vaccine resistant respondents (U = 12,455.50, p = .025).

3.3.2. Peer influences

Significant differences in peer social influence (H (2) = 148.14, p < .001) were found between all groups of the Irish sample. Peer influence was significantly lower in both the vaccine hesitant (U = 4920.00, p < .001) and vaccine resistant (U = 2540.00, p < .001) groups when compared to those who were vaccine acceptant. Similar findings were highlighted among the UK sample (H (2) = 210.97, p < .001), where peer influence was much higher in those who were vaccine accepting when compared to both the vaccine resistant (U = 2115.50, p < .001) and hesitant groups (U = 5751.50, p < .001). Lowest rates of peer influence were reported in those who were vaccine resistant.

3.3.3. Government response

Within the Irish sample, a significance between government response and intention to vaccinate (H (2) = 42.40, p < .001) was reported. Post

Table 2
Comparisons of combined sample baseline characteristics by vaccination intention group.

Characteristics		n (%)	Accepting	Resistant	Hesitant	Chi square tests of independence
			Observed (expected)	Observed (expected)	Observed (expected)	
Sample	Irish	500 (46.3)	384 (374.8)	48 (54.7)	68 (69.5)	x^2 (2) = 1.91, p = .38
	UK	579 (53.7)	427 (435.2)	70 (63.3)	82 (80.5)	φ = 0.04
						n = 1079
Gender	Female	858 (80)	629 (645.9)	98 (92.8)	131 (119.3)	x^2 (2) = 9.44, p = .00
	Male	214 (20)	178 (161.1)	18 (23.2)	18 (29.7)	φ = 0.09
						n = 1079
Ethnicity	White	1011 (93.7)	779 (759.9)	102 (110.6)	130 (140.5)	x^2 (2) = 20.70, p = .00
						φ = 0.17
	BAME	68 (6.3)	32 (51.1)	16 (7.4)	20 (9.5)	n = 1079
SES	Higher SES	502 (46.5)	392 (377.3)	52 (54.9)	58 (69.8)	x^2 (2) = 5.08, p = .07
	Lower SES	577 (53.5)	419 (433.7)	66 (63.1)	92 (80.2)	φ = 0.07
						n = 1079
Political orientation	Conservative	108 (10.1)	79 (81.4)	15 (11.7)	14 (15)	x^2 (2) = 10.75, p = .03
	Middle ground	472 (44.3)	339 (355.5)	51 (50.9)	82 (65.5)	φ = 0.07
	Liberal	486 (45.6)	385 (366.1)	49 (52.4)	52 (67.5)	n = 1066
Health status	Clinically vulnerable	179 (16.6)	133 (134.5)	19 (19.6)	27 (24.9)	x^2 (2) = 0.25, p = .88
						φ = 0.01
	No underlying illness	899 (83.4)	677 (675.5)	99 (98.4)	123 (125.1)	n = 1078
Previous COVID infection	No	933 (86.5)	707 (701.3)	99 (102)	127 (129.7)	x^2 (2) = 1.43, p = .49
	Yes	146 (13.5)	104 (109.7)	19 (16)	23 (20.3)	φ = 0.03
						n = 1079
Public facing job	Yes	538 (50)	402 (404)	64 (59)	72 (75)	x^2 (2) = 1.10, p = .57
	No	538 (50)	406 (404)	54 (59)	78 (75)	φ = 0.03
						n = 1076
Information seeking	Yes	740 (68.7)	602 (555.9)	63 (81.1)	75 (103.1)	x^2 (2) = 49.54, p < .00
	No	337 (31.3)	207 (253.1)	55 (36.9)	75 (46.9)	φ = 0.21§
						n = 1077
Information source	Mainstream media	705 (65.3)	564 (529.9)	53 (77.1)	88 (98)	x^2 (2) = 31.01, p = .00
	Social media	374 (34.7)	247 (281.1)	65 (40.9)	62 (52)	φ = 0.17
						n = 1079
Past flu vaccination	Yes	488 (45.3)	423 (366.7)	21 (53.4)	44 (67.9)	x^2 (2) = 67.12, p = .00
	No	590 (54.7)	387 (443.3)	97 (64.6)	106 (82.1)	φ = 0.25
						n = 1078
Present flu vaccination	Yes	356 (33)	331 (267.6)	6 (38.9)	19 (49.5)	x^2 (2) = 92.04, p = .00
	No	723 (67)	480 (543.4)	112 (79.1)	131 (100.5)	φ = 0.29
						n = 1079
Civic responsibility (duty vs choice)	Duty	755 (73.4)	634 (564)	30 (83.7)	91 (107.2)	x^2 (2) = 172.40, p = .00
	Choice	244 (23.7)	120 (182.3)	76 (27.1)	48 (34.7)	φ = 0.29
	Prefer not to say	29 (2.8)	14 (21.7)	8 (3.2)	7 (4.1)	n = 1028

Table 3
Comparisons of Irish baseline characteristics by vaccination intention group.

Characteristics		n (%)	Accepting	Resistant	Hesitant	Chi square tests of independence
			Observed (expected)	Observed (expected)	Observed (expected)	
Gender	Female	386 (77.2)	287 (296.1)	38 (37.2)	61 (52.7)	x^2 (2) = 7.11, p = .03
	Male	112 (22.4)	95 (85.9)	10 (10.8)	7 (15.3)	φ = 0.12
						n = 498
Ethnicity	White	496 (99.2)	380 (380.9)	48 (47.6)	68 (67.5)	x^2 (2) = 1.22, p = .54
	BAME	4 (0.8)	4 (3.1)	0 (0.4)	0 (0.5)	φ = 0.05
						n = 500
SES	Higher SES	263 (52.6)	207 (202)	25 (25.2)	31 (35.8)	x^2 (2) = 1.6, p = .45
	Lower SES	237,947.4)	177 (182.0)	23 (22.8)	37 (32.2)	φ = 0.05
						n = 500
Political orientation	Conservative	36 (7.2)	26 (27.6)	4 (3.4)	6 (4.9)	x^2 (4) = 10.77, p = .03
	Middle ground	227 (45.4)	163 (174.3)	22 (21.8)	42 (30.9)	φ = 0.15
	Liberal	237 (47.4)	195 (182)	22 (22.8)	20 (32.2)	n = 500
Health status	Clinically vulnerable	63 (12.6)	43 (48.4)	7 (6)	13 (8.6)	x^2 (2) = 3.48, p = .18
	No underlying illness	437 (87.4)	341 (335.60)	41 (42)	55 (59.4)	j = 0.08
						n = 500
Previous COVID infection	No	449 (89.8)	351 (344.8)	40 (43.1)	58 (61.1)	x^2 (2) = 4.78, p = .09
	Yes	51 (10.2)	33 (39.2)	8 (4.9)	10 (6.9)	φ = 0.10
						n = 500
Public facing job	Yes	51 (10.2)	209 (208.1)	27 (26)	35 (36.9)	x^2 (2) = 0.293, p = .86
	No	449 (89.8)	175 (175.9)	21 (22)	33 (31.1)	φ = 0.02
						n = 500
Information seeking	Yes	369 (73.8)	301 (283.4)	29 (35.4)	39 (50.2)	x^2 (2) = 18.13, p < .001
	No	131 (26.2)	83 (100.6)	19 (12.6)	29 (17.8)	φ = 0.19
						n = 500
Information source	Mainstream media	316 (63.2)	256 (242.7)	26 (30.3)	34 (43)	x^2 (8) = 40.14, p < .001
	Social media	184 (36.8)	128 (141.3)	22 (17.7)	34 (25)	φ = 0.28
						n = 500
Past flu vaccination	Yes	191 (38.2)	173 (146.7)	3 (18.3)	15 (26)	x^2 (2) = 35.89, p < .001
	No	309 (61.8)	211 (237.3)	45 (29.7)	53 (42)	φ = 0.27
						n = 500
Present flu vaccination	Yes	143 (28.6)	132 (109.8)	3 (13.7)	8 (19.4)	x^2 (2) = 27.45, p < .001
	No	357 (71.4)	252 (274.2)	45 (34.3)	60 (48.6)	φ = 0.23
						n = 500
Civic responsibility (duty vs choice)	Duty	384 (76.8)	326 (294.9)	13 (36.9)	45 (52.2)	x^2 (4) = 90.20, p < .001
	Choice	102 (20.4)	50 (78.3)	33 (9.8)	19 (13.9)	φ = 0.30
	Prefer not to say	14 (2.8)	8 (10.8)	2 (1.3)	4 (1.9)	n = 500

hoc analysis suggests significant differences across groups; where the vaccine accepting group reported significantly higher satisfaction to government response when compared to the vaccine resistant group (U = 4602.50, p < .001), and the vaccine hesitant group (U = 9228.50, p < .001). Significant differences were also found in the UK sample (H (2) = 18.920, p < .000); where those who were vaccine accepting had higher rates of satisfaction based on government response when compared to those who were vaccine resistant (U = 6479.00, p < .001).

3.3.4. Fear of Covid

Relative to the Irish sample, fear of Covid (H (20) = 63.27, p < .001) was significantly heightened within the vaccine accepting group when compared to those in the resistant group (U = 2725.50, p < .001). Likewise, those who were vaccine hesitant had higher rates of COVID fear compared to those who were vaccine resistant (U = 602.00, p < .001). Within the UK sample, fear of Covid (H (2) = 23.13, p < .001) was highest among the vaccine accepting groups. Those who were vaccine resistant had the lowest rates of fear, followed by those who were vaccine hesitant.

3.3.5. Civic responsibility

Among the Irish sample, civic responsibility (H (2) = 161.791, p < .001) was significantly higher in those who were vaccine accepting when compared to those who were vaccine resistant (U = 793.00, p < .001), and those who were vaccine hesitant (U = 5234.50, p < .001). Differences in civic responsibility were found between the hesitant and resistant group, where those who were vaccine hesitant reported a higher regard for civic responsibility (U = 390.50, p < .001). Civic responsibility within the UK sample differed across all groups (H (2) = 204.23, p < .001). Civic responsibility was higher in the vaccine accepting when compared to both the vaccine hesitant (U = 6771.00, p < .001) and vaccine resistant groups (U = 15.36.50, p < .001). Lowest rates of CR were documented in those who were vaccine resistant, followed by those who were vaccine hesitant.

3.3.6. Adherence to public health guidelines

Within the Irish sample, adherence (H (2) = 21.83, p < .001) to public health guidelines was significantly higher in those who were vaccine accepting than those who were vaccine resistant (U = 5639.50, p < .001). Similarly, adherence was higher in those who were vaccine hesitant compared to those who were vaccine resistant (U = 1115.50, p = .004). Within the UK sample, adherence to health guidelines (H (2) = 25.79, p < .001) was highest in those who were vaccine accepting, and lowest in those who were vaccine resistant with a significant difference being reported in both groups (U = 9848.50, p < .001). Similarly, adherence was higher in those who were accepting vs hesitant group were recorded (U = 14,186.50, p = .006).

3.3.7. Trust in authorities

Trust in authorities (e.g., HSE and Government) revealed significant differences with intention to vaccinate (H (2) = 21.82, p < .001). Those who were vaccine accepting reported higher levels of trust than both the vaccine hesitant (U = 5716.00, p < .001) and the vaccine resistant groups (U = 1728.50, p < .001). Those who vaccine hesitant also had higher trust in authorities compared to those who were resistant (U = 720.50, p < .001). Within the UK sample, trust in authorities (H (2) = 128.69, p < .001) was lowest in those who were vaccine resistant, and highest in those who were vaccine accepting. Post-hoc analysis revealed

Table 4
Comparisons of UK baseline characteristics by vaccination intention group.

Characteristics		n (%)	Accepting	Resistant	Hesitant	Chi square tests of independence
			Observed (expected)	Observed (expected)	Observed (expected)	
Gender	Female	472 (81.5)	342 (249.5)	60 (55.9)	70 (66.6)	x^2 (2) = 3.55, p = .17 φ = 0.08
	Male	102 (17.6)	83 (75.5)	8 (12.1)	11 (14.4)	n = 574
Ethnicity	White	515 (88.9)	399 (379.8)	54 (62.3)	62 (72.9)	x^2 (2) = 33.53, p < .001 φ = 0.24
	BAME	64 (11.1)	28 (47.2)	16 (7.7)	20 (9.1)	n = 579
SES	Higher SES	239 (41.3)	185 (175.7)	27 (29.1)	27 (34.1)	x^2 (2) = 3.6, p = .16 φ = 0.08
	Lower SES	335 (57.9)	237 (246.3)	43 (40.9)	55 (47.9)	n = 574
Political Orientation	Conservative	72 (12.4)	53 (53.3)	11 (8.5)	8 (10.2)	x^2 (4) = 2.85, p = .58
	Middle ground	245 (42.3)	176 (181.4)	29 (29.0)	40 (34.6)	φ = 0.07 n = 566
	Liberal	249 (43.0)	190 (184.3)	27 (29.5)	32 (35.2)	
Health status	Clinically vulnerable	94 (16.2)	71 (68.8)	10 (11.5)	13 (13.7)	x^2 (2) = 0.36, p = .83
	No underlying illness	462 (79.8)	336 (338.2)	58 (56.5)	68 (67.3)	φ = 0.02 n = 556
Previous COVID infection	No	484 (83.6)	356 (356.9)	59 (58.5)	69 (68.5)	x^2 (2) = 0.06, p = .97 φ = 0.01
	Yes	95 (16.4)	71 (70.1)	11 (11.5)	13 (13.5)	n = 579
Public facing job	Yes	267 (46.1)	193 (196.5)	37 (32.4)	37 (38.0)	x^2 (2) = 1.36, p = .50 φ = 0.05
	No	309 (53.4)	231 (227.5)	33 (37.6)	45 (44.0)	n = 576
Information seeking	Yes	371 (64.1)	301 (273.3)	34 (45.0)	36 (52.2)	x^2 (2) = 30.28, p < .001 φ = 0.23
	No	206 (35.6)	124 (151.7)	36 (25.0)	46 (29.3)	n = 577
Information source	Mainstream media	389 (67.2)	308 (286.9)	27 (47)	54 (55.1)	x^2 (8) = 55.76, p < .001 φ = 0.31
	Social media	190 (32.8)	119 (140.1)	43 (23)	28 (26.9)	n = 579
Past flu vaccination	Yes	297 (51.3)	250 (218.9)	18 (36.0)	29 (42.1)	x^2 (2) = 35.97, p < .001 φ = 0.25
	No	281 (48.5)	176 (207.1)	52 (34.0)	53 (39.9)	n = 578
Present flu vaccination	Yes	213 (36.8)	199 (157.1)	3 (25.8)	11 (30.2)	x^2 (2) = 68.75, p < .001 φ = 0.34
	No	366 (63.2)	228 (269.9)	67 (44.2)	71 (51.8)	n = 579
Civic responsibility (duty vs choice)	Duty	371 (64.1)	308 (269.8)	17 (46.4)	46 (54.8)	x^2 (4) = 86.69, p < .001 φ = 0.40
	Choice	142 (24.5)	70 (103.3)	43 (17.8)	29 (21.0)	n = 528
	Prefer not to say	15 (2.6)	6 (10.9)	6 (1.9)	3 (2.2)	

significant differences between all groups: where U = 1228.50, p < .001 (resistant/accepting); U = 639.500, p < .001 (resistant/hesitant); U = 4848.00, p < .001 (accepting/hesitant).

3.3.8. Vaccination attitudes

Vaccine attitudes (H (2) = 168.13, p < .001) showed a significant difference across all groups of the Irish sample. Those in the accepting group reported more positive attitudes towards vaccination when compared to the hesitant group (U = 4637.00, p < .001). Correspondingly, those who were vaccine resistant received the lowest scores for positive vaccination attitudes when compared to those who were vaccine hesitant (U = 749.50, p < .001); and vaccine accepting, (U = 853.00, p < .001). Analysis of the UK sample revealed that vaccine attitudes (H (2) = 213.29, p < .001) differed across the vaccine accepting vs resistant group, (U = 1680.50, p < .001); the resistant vs hesitant group (U = 1666.00, p < .001); and the accepting vs hesitant group (U = 5819.50, p < .001). Those who were vaccine resistant received the lowest scores for positive vaccination attitudes, followed by those who were hesitant.

3.3.9. Perceived risk

Rates of perceived risk (H (2) = 174.43, p < .001) were different across all groups of the Irish sample. The vaccine accepting group received a lower report of vaccine risk when compared to both the vaccine resistant (U = 1206.50, p < .001); and the vaccine hesitant group (U = 3337.00, p < .001). Within the UK sample, those who were vaccine accepting had lower perceived risk of the vaccine when compared to both the vaccine hesitant (U = 3095.50, p < .001), and the vaccine resistant (U = 1421.50, p < .001).

3.3.10. Perceived benefit

Perceived benefit (H (2) = 148.17, p < .001) of a COVID-19 vaccine was highest among the vaccine accepting Irish population, followed by the vaccine hesitant and the vaccine resistant. Post hoc revealed significance among all groups; where the accepting had higher rates of perceived vaccine benefit that the resistant group (U = 1374.50, p < .001); and the hesitant group (U = 5600.50, p < .001). Similarly, results from the UK sample identified that perceived benefit (H (2) = 276.88 p < 001) was highest among those who were vaccine accepting, followed by those who were vaccine hesitant, and those who were vaccine

Table 5
Means and standard deviations for continuous predictor variables of the combined sample.

Variable	α	Intention to vaccinate			p
		Accepting	Resistant	Hesitant	
		M (SD)	M (SD)	M (SD)	
Age		37.63 (15.72)	38.66 (14.36)	31.97 (14.03)	<0.001
Flu vaccine plan		3.99 (1.88)	1.46 (1.18)	2.51 (1.58)	<0.001
Peer influence		4.51 (0.85)	2.50 (1.18)	3.35 (0.97)	<0.001
GP influence		2.62 (0.78)	1.55 (0.68)	2.26 (0.94)	<0.001
Government influence		1.96 (0.98)	1.47 (0.51)	1.50 (0.70)	<0.001
Government response	0.88	29.40 (8.05)	22.90 (8.51)	26.49 (7.86)	<0.001
Fear of Covid	0.85	17.12 (5.82)	12.23 (6.06)	16.63 (6.73)	<0.001
Adherence	0.82	55.14 (5.78)	47.03 (12.92)	53.16 (6.95)	<0.001
Trust in authorities	0.73	143.33 (38.35)	56.89 (44.53)	102.74 (41.65)	<0.001
Vaccination attitudes	0.63	8.54 (1.63)	4.68 (1.50)	6.22 (1.79)	<0.001
Perceived risk	0.80	6.97 (2.80)	14.62 (3.44)	12.05 (2.83)	<0.001
Perceived benefit	0.89	17.92 (2.77)	9.08 (3.92)	13.85 (3.27)	<0.001
Perceived severity	0.60	7.48 (1.67)	5.19 (2.27)	7.02 (1.82)	<0.001
Perceived susceptibility	0.44	7.13 (1.83)	5.72 (1.72)	6.60 (1.66)	<0.001
Civic responsibility	0.64	12.99 (2.05).	6.84 (2.78)	10.50 (2.10)	<0.001

Table 6
Means and standard deviations for continuous predictor variables of the Irish sample.

Variable	α	Intention to vaccinate			p*
		Accepting	Resistant	Hesitant	
		M (SD)	M (SD)	M (SD)	
Age		34.68 (13.97)	44.17 (13.48)	32.34 (13.36)	<0.001
Flu vaccine plan		3.80 (1.83)	1.38 (1.23)	2.50 (1.58)	<0.001
Peer influence		4.54 (0.85)	2.69 (1.37)	3.38 (1.02)	<0.001
GP influence		2.72 (0.69)	1.46 (0.65)	2.50 (0.87)	<0.001
Government influence		2.07 (0.98)	1.42 (0.54)	1.57 (0.72)	<0.001
Government response	0.84	32.30 (6.44)	25.02 (8.41)	28.67 (7.13)	<0.001
Fear of Covid	0.84	17.37 (5.70)	10.50 (4.39)	17.02 (6.51)	<0.001
Adherence	0.77	55.17 (5.07)	48.06 (2.85)	53.95 (5.45)	<0.001
Trust in authorities	0.87	145.07 (38.91)	51.45 (50.69)	100.07 (45.00)	<0.001
Vaccination attitudes	0.66	8.54 (1.71)	4.39 (1.39)	6.20 (1.88)	<0.001
Perceived risk	0.80	7.17 (2.91)	15.08 (3.87)	12.13 (3.19)	<0.001
Perceived benefit	0.93	17.58 (3.34)	8.56 (4.61)	13.70 (3.93)	<0.001
Perceived severity	0.60	7.44 (1.59)	4.62 (2.05)	7.45 (1.80)	<0.001
Perceived susceptibility	0.40	7.30 (1.73)	5.70 (1.52)	7.14 (1.41)	<0.001
Civic responsibility	0.66	13.08 (08)	6.10 (2.85)	10.54 (2.32)	<0.001

p* significance value based on results from Kruskal-Wallis.
a Cronbach alpha value.

Table 7
Means and standard deviations for continuous predictor variables of the UK sample.

Variable	α	Intention to vaccinate			p
		Accepting	Resistant	Hesitant	
		M (SD)	M (SD)	M (SD)	
Age		40.27 (16.72)	34.90 (13.79)	31.66 (14.63)	<0.001
Flu vaccine plan		4.16 (1.91)	1.51(1.51)	2.52 (1.60)	<0.001
Peer influence		4.48 (0.85)	2.37 (1.03)	3.33 (0.93)	<0.001
GP influence		2.52 (0.84)	1.61 (0.70)	2.08 (0.97)	<0.001
Government influence		1.86 (2.52)	1.50 (0.50)	1.44 (0.69)	<0.001
Government response	0.89	26.19 (8.45)	21.12 (8.25)	23.89 (7.97)	<0.001
Fear of Covid	0.86	16.90 (5.93)	13.52 (6.75)	16.30 (6.92)	<0.001
Adherence	0.85	55.12 (6.36)	46.32 (14.34)	52.51 (7.96)	<0.001
Trust in authorities	0.60	141.39 (37.68)	61.81 (37.93)	105.92 (37.40)	<0.001
Vaccination attitudes	0.62	8.55 (1.57)	4.88 (1.55)	6.24 (1.71)	<0.001
Perceived risk	0.82	6.79 (2.65)	14.31 (3.10)	11.98 (2.52)	<0.001
Perceived benefit	0.96	18.22 (2.10)	9.44 (3.35)	13.97 (2.62)	<0.001
Perceived severity	0.60	7.51 (1.74)	5.58 (2.34)	6.65 (1.77)	<0.001
Perceived susceptibility	0.48	6.98 (1.74)	5.72 (1.86)	6.15 (1.73)	<0.001
Civic responsibility	0.62	12.90 (2.00)	7.36 (2.64)	10.46 (1.91)	<0.001

resistant. Significant differences were reported across the vaccine accepting vs resistant group ($U = 495.00$, $p < .001$); the resistant vs hesitant group ($U = 861.00$, $p < .001$); and the accepting vs hesitant group ($U = 3552.00$, $p < .001$).

3.3.11. Perceived severity

Within the Irish sample, perceived severity ($H(2) = 64.58$, $p < .001$) scores were significantly higher in the vaccine hesitant ($U = 529.50$, $p < .001$) and the vaccine accepting ($U = 2789.00$, $p < .001$) groups compared to those who were vaccine resistant. Similarly, in the UK sample, perceived severity ($H(2) = 51.45$, $p < .001$) scores were significantly higher in both the vaccine accepting ($U = 7768.50$, $p < .001$) and vaccine hesitant ($U = 2033.50$, $p < .001$) group when compared to the vaccine resistant group. Differences were also highlighted between the vaccine accepting and hesitant group; where perceived severity scores were highest in those accepting of the vaccine ($U = 12{,}929.00$, $p < .001$).

3.3.12. Perceived susceptibility

Perceived susceptibility ($H(2) = 38.43$, $p < .001$) scores were highest among Irish participants who were vaccine accepting and lowest among those who were vaccine resistant. Significant differences were found between all other groups; where perceived susceptibility was highest among the vaccine accepting group vs resistant groups ($U = 4362.50$, $p < .001$). Similarly, perceived susceptibility was higher among the vaccine hesitant compared to the resistant group ($U = 885.50$, $p < .001$). Correspondingly, perceived susceptibility ($H(2) = 33.20$, $p < .001$) scores among the UK only revealed a significant difference between the accepting vs resistant group ($U = 9542.00$, $p < .001$); and the accepting and hesitant group ($U = 12{,}990.50$, $p < .001$); where the vaccine accepting group scored significantly higher in perceived susceptibility in both groups.

3.4. Multivariate analyses of vaccination intentions

3.4.1. Results from analysis of the combined sample

A multinomial logistic regression was performed on the overall sample (see Table 8) to model the relationship between the significant predictors and membership in three groups: vaccine accepting, resistant and hesitant. The reference category for the outcome variable was 'vaccine accepting'; where the remaining two categories were compared to this reference group. Model of fitness was assessed using a likelihood ratio chi square test, where $x^2(46) = 741.46.03$, McFadden $r^2 = 0.62$, $p < .001$; indicating that the current set of predictors used in the model represent a significant improvement in fit relative to the null model. Chi-square goodness of fit tests also suggest a well-fitting model, where the Pearson's and Deviance's r squared >1.0. (See Tables 9 and 10.)

Relative to those who were vaccine accepting, those who were vaccine resistant higher perceived vaccine risk (AOR = 1.2, CI = 1.00, 1.49); less positive vaccination attitudes (AOR = 0.48, CI = 0.33, 0.69); and lower civic responsibility (AOR = 0.59, CI = 0.46, 0.76). Additionally, relative to the vaccine accepting group; individuals who were vaccine resistant were less likely to be influenced by their GP (AOR = 0.32, CI = 0.17, 0.61); were less likely to have peers who viewed vaccination as important (AOR = 0.33, CI = 0.20, 0.55); and more likely to view adherence to public health guidelines as an act of choice rather than duty (AOR = 0.31, CI = 0.10, 0.93).

Relative to the vaccine accepting, the vaccine hesitant reported higher COVID-19 severity perceptions (AOR = 1.32, CI = 1.06, 1.63) and also increased vaccine risk (AOR = 1.26, CI = 1.12, 1.4). Additionally, individuals were more likely to be vaccine hesitant if they had negative vaccination attitudes (AOR = 0.67, CI = 0.56, 0.80); if they had lower civic responsibility (AOR = 0.75, CI = 0.65, 0.88); and if they did not have peers who viewed vaccination as important (AOR = 0.43, CI = 0.32, 0.59). When compared to those who were vaccine accepting, individuals who were vaccine hesitant were less likely to be influenced by their government to vaccinate (AOR = 0.67, CI = 0.46, 0.98).

3.4.2. Results from independent examination of the Irish and UK samples

Using the same reference category, separate multinomial logistic regressions were performed on the Irish sample (N = 500) and the UK sample (N = 579) to identify any population-specific correlates of vaccination hesitancy and refusal. Model of fitness for the Irish and UK sample were assessed using a likelihood ratio chi square test; where $x^2(44) = 417.03$, McFadden $r^2 = 0.63$, $p < .001$ (Irish); and $x^2(42) = 383.77$, McFadden $r^2 = 0.73$, $p < .001$ (UK), indicating that the current set of predictors used in the model represent a significant improvement in fit relative to the null model. Chi-square goodness of fit tests for both models also suggest a well-fitting model, where the Pearson's and Deviance's r squared >1.0.

In the Irish sample, those who were vaccine resistant- compared to those who were vaccine accepting- had higher perceived vaccine risk (AOR = 1.33, CI = 1.01, 1.73); less positive vaccination attitudes (AOR = 0.58, CI = 0.34, 98); lower civic responsibility (AOR = 0.63, CI = 0.44, 89); perceived less peer influence to vaccinate (AOR = 0.44, CI = 0.22, 0.88), and less GP influence to vaccinate (AOR = 0.20, CI = 0.07, 0.53). In the UK sample, those who were vaccine resistant were more likely to perceive less vaccine benefit (AOR = 0.51, CI = 0.30, 0.86); less positive attitude towards vaccination (AOR = 0.20, CI = 0.07, 0.60); less trust in authorities (AOR = 0.20, CI = 0.07, 0.60); less likely to be influenced by their GP to vaccinate (AOR = 0.13, CI = 0.02, 0.75); were less likely to have peers who viewed vaccination as important (AOR = 0.08, CI = 0.02, 0.38); and with higher rates of adherence to public health guidelines (AOR = 1.22, CI = 1.04, 1.44).

In the Irish sample, those who were vaccine hesitant were more likely to be female (AOR = 0.17, CI = 0.04, 0.66); have higher perceived vaccine risk (AOR = 1.18, CI = 1.02, 1.35); higher perceived severity regarding COVID-19 (AOR = 1.52, CI = 1.14, 2.04); less positive vaccine attitudes (AOR = 0.62, CI = 0.49, 79); less civic responsibility (AOR = 0.75, CI = 0.62, 0.90); and were less likely to have peers who viewed vaccination as important (AOR = 0.43, CI = 0.29, 64). Results from the UK sample identified that relative to the vaccine accepting group, individuals who were vaccine hesitant had higher perceived vaccine risk (AOR = 1.55, CI = 1.67, 2.07); less perceived vaccine benefit (AOR = 0.68, CI = 0.50, 0.93); less likely to have peers who viewed vaccination as important (AOR = 0.40, CI = 0.20, 0.78); and higher rates of adherence to public health guidelines (AOR = 1.13, CI = 1.01, 1.25).

Table 8
Sociodemographic, psychological, and behavioural indicators associated with vaccine intention in the combined sample.

Variable	Would you accept a COVID-19 vaccine							
	Reference = vaccine acceptant							
	Vaccine resistant				Vaccine hesitant			
	AOR	95% CI		SE	AOR	95% CI		SE
Gender	0.31	0.06	1.51	0.80	0.32	0.12	0.86	0.50
Ethnicity	1.65	0.23	11.92	1.00	0.48	0.14	1.70	0.63
Age	0.99	0.95	1.03	0.02	0.99	0.97	1.01	0.01
Flu vaccine past	0.37	0.10	1.38	0.66	0.64	0.32	1.30	0.35
Flu vaccine present	0.29	0.04	1.86	0.95	0.64	0.26	1.57	0.45
Peer influence	**0.33**	**0.20**	**0.55**	**0.26**	**0.43**	**0.31**	**0.59**	**0.16**
Conservative	1.70	0.30	9.52	0.87	0.89	0.28	2.8	0.58
Liberal	1.15	0.38	3.42	0.55	0.90	0.46	1.76	0.34
Government influence	0.99	0.44	2.22	0.41	**0.67**	**0.46**	**0.98**	**0.19**
GP influence	**0.32**	**0.17**	**0.61**	**0.33**	0.83	0.57	1.20	0.19
Actively seeking COVID-19 information	0.94	0.33	2.65	0.53	0.65	0.35	1.22	0.32
Covid information source	9.83	0.30	2.30	0.51	1.19	0.64	2.20	0.31
Duty/choice	**0.31**	**0.10**	**0.93**	**0.55**	1.05	0.52	2.12	0.36
Government response	0.97	0.90	1.04	0.03	0.98	0.93	1.02	0.02
Fear of COVID	0.92	0.84	1.01	0.05	0.96	0.90	1.01	0.03
Civic Responsibility	**0.58**	**0.46**	**0.75**	**0.13**	**0.75**	**0.65**	**0.88**	**0.08**
Adherence	1.04	0.97	1.12	0.03	1.04	0.99	1.10	0.03
Trust in authorities	0.98	0.97	1.00	0.00	0.99	0.98	1.00	0.00
Vaccination attitudes	**0.48**	**0.33**	**0.69**	**0.18**	**0.67**	**0.56**	**0.80**	**0.09**
Perceived risk	**1.22**	**1.00**	**1.49**	**0.10**	**1.25**	**1.12**	**1.40**	**0.06**
Perceived benefit	0.92	0.77	1.11	0.09	**0.97**	**0.87**	**1.08**	**0.06**
Perceived severity	1.27	0.90	1.79	0.17	1.32	1.06	1.64	0.11
Perceived susceptibility	0.94	0.69	1.28	0.15	0.88	0.73	1.07	0.09

Statistically significant comparisons in bold.

Table 9
Sociodemographic, psychological, and behavioural indicators associated with vaccine intention in the Irish sample.

Variable	Would you accept a COVID-19 vaccine							
	Reference = vaccine acceptant							
	Vaccine resistant				Vaccine hesitant			
	AOR	95% CI		SE	AOR	95% CI		SE
Gender	0.48	0.05	4.41	1.13	**0.17**	**0.04**	**0.66**	**0.69**
Age	0.99	0.93	1.06	0.03	0.99	0.96	1.03	0.01
Flu vaccine past	0.09	0.00	1.49	1.43	0.75	0.29	1.96	0.49
Flu vaccine present	1.29	0.07	22.29	1.45	0.50	0.16	1.60	0.59
Conservative	2.87	0.28	28.73	1.17	1.10	0.24	5.06	0.77
Liberal	0.76	0.13	4.27	0.88	0.79	0.33	1.9 2	0.45
Peer influence	**0.43**	**0.21**	**0.88**	**0.36**	**0.43**	**0.29**	**0.64**	**0.20**
Government influence	1.05	0.32	3.45	0.60	0.62	0.38	1.00	0.24
GP influence	**0.20**	**0.07**	**0.53**	**0.50**	0.92	0.53	1.59	0.28
Actively seeking COVID-19 information	0.55	0.11	2.77	0.82	0.68	0.29	1.60	0.43
Covid information source	0.29	0.06	1.38	0.80	1.24	0.54	2.86	0.42
Duty/choice	0.30	0.06	1.38	0.78	0.83	0.33	2.11	0.47
Government response	0.99	0.87	1.12	0.06	0.97	0.90	1.05	0.04
Fear of COVID	0.90	0.76	1.07	0.08	0.96	0.89	1.03	0.04
Civic Responsibility	**0.62**	**0.44**	**0.88**	**0.18**	**0.74**	**0.62**	**0.89**	**0.09**
Adherence	1.00	0.89	1.12	0.06	1.00	0.93	1.08	0.04
Trust in authorities	0.99	0.97	1.01	0.01	0.99	0.98	1.00	0.00
Vaccination attitudes	**0.58**	**0.34**	**0.98**	**0.26**	**0.62**	**0.49**	**0.78**	**0.12**
Perceived risk	**1.32**	**1.00**	**1.73**	**0.14**	**1.17**	**1.02**	**1.35**	**0.07**
Perceived benefit	1.07	0.83	1.38	0.13	1.05	0.92	1.20	0.07
Perceived severity	1.17	0.69	1.98	0.27	**1.52**	**1.13**	**2.04**	**0.15**
Perceived susceptibility	0.71	0.43	1.17	25	1.52	1.13	2.04	0.14

Statistically significant comparisons in bold.

Table 10
Sociodemographic, psychological, and behavioural indicators associated with vaccine intention in the UK sample.

Variable	Would you accept a COVID-19 vaccine							
	Reference = vaccine acceptant							
	Vaccine resistant				Vaccine hesitant			
	AOR	95% CI		SE	AOR	95% CI		SE
Gender	0.28	0.00	8.60	1.74	0.66	0.07	5.62	1.09
Ethnicity	0.75	0.01	40.91	2.03	0.61	0.10	3.73	0.92
Age	1.00	0.91	1.09	0.04	0.99	0.95	1.05	0.02
Flu vaccine past	1.49	0.11	18.68	1.29	0.73	0.22	2.40	0.60
Flu vaccine present	0.06	0.00	2.38	1.84	0.58	0.11	2.98	0.83
Peer influence	**0.08**	**0.02**	**0.38**	**0.75**	**3.39**	**0.20**	**0.78**	**0.34**
Government influence	1.14	0.16	7.83	0.98	0.92	0.42	2.05	0.40
GP influence	**0.13**	**0.02**	**0.75**	**0.90**	3.77	0.38	1.55	0.36
Actively seeking COVID-19 information	1.10	0.08	13.95	1.29	0.52	0.16	1.70	0.60
Covid information source	2.27	0.26	19.91	1.10	0.59	0.18	1.99	0.61
Duty/choice	1.27	0.09	17.24	1.33	1.38	0.33	5.71	0.72
Government response	0.92	0.78	1.08	0.08	0.94	0.86	1.01	0.04
Fear of COVID	0.86	0.69	1.07	0.11	0.91	0.81	1.01	0.05
Civic Responsibility	0.53	0.27	1.03	0.34	0.85	0.58	1.24	0.19
Adherence	**1.21**	**1.03**	**1.43**	**0.08**	**1.13**	**1.01**	**1.25**	**0.05**
Trust in authorities	0.95	0.91	0.98	0.01	0.99	0.97	1.00	0.01
Vaccination attitudes	**0.20**	**0.07**	**0.60**	**0.55**	0.80	0.56	1.13	0.18
Perceived risk	1.07	0.91	0.98	0.26	**1.55**	**1.17**	**2.07**	**0.15**
Perceived benefit	**0.51**	**0.30**	**0.86**	**0.27**	**0.68**	**0.49**	**0.93**	**0.16**
Perceived severity	1.14	0.51	2.54	0.40	1.12	0.73	1.72	0.21
Perceived susceptibility	1.18	0.58	2.38	0.35	0.81	0.58	1.13	0.17

Statistically significant comparisons in bold.

4. Discussion

The present study identified several important components relating to the intention to vaccinate against COVID-19 in both Ireland and the UK. This research was conducted during nationwide lockdowns with infection levels and subsequent death rates at their peak, and public health authorities actively encouraging adherence to the imposed COVID-19 guidelines and promoting vaccination uptake. In this environment, similar rates of vaccine hesitancy acceptance and resistance were evident in the Irish and UK samples, with a total of 76.8% Irish respondents, and 73.7% UK respondents indicating that they intended to be immunized (*vaccine accepting*) if the government advised to uptake the COVID-19 vaccination. These findings align with research conducted by Murphy et al. (2021) and Neumann-Boehme et al. (2020) where vaccine hesitancy and resistance rates fell between 10% and 26%. This positive intention towards COVID-19 vaccination is much higher than reports of intention levels from previous pandemic research (e.g., Byrne et al., 2012); which is an encouraging finding as vaccine distribution remains to be the main pivotal point for control over the viral transmission. Of the remaining participants, 9.6% of Irish respondents, and

12.1% of UK respondents did not intend to vaccinate (*vaccine resistant*); and 13.6% of Irish respondents, and 14.2% of UK respondents said they were unsure if they would vaccinate or not (vaccine hesitant).

4.1. The psychological and behavioural profile of vaccine hesitant individuals

Frequencies in data highlighted women had the highest rates of vaccine hesitancy, with between 15% and 20% of this group saying they were unsure about getting the vaccine. Notably, multivariate analysis of the Irish sample reported a significant correlate of vaccine hesitancy among females. Results from independent non-parametric tests from both samples suggest that those who were vaccine hesitant had a significantly younger age than both the vaccine resistant and vaccine accepting groups. Distinctions in intention to vaccinate against COVID-19 based on age and gender have been seen in several other similar studies (Callaghan et al., 2021; Murphy et al., 2021); as well as in research examining intention to vaccinate against other infectious diseases (Flanagan et al., 2017; Pulcini et al., 2013).

Regression modelling of the overall sample (UK and Ireland), identified that those who were vaccine hesitant had more negative attitudes towards vaccination, had an increased rate of perceived COVID-19 severity, and were less likely to be influenced by their government. These findings suggest a heightened negative emotional response among the vaccine hesitant; both regarding the disease itself and its vaccine. Much of the decrease in influence may be attributed to an erosion of trust in scientific research and vaccination effectiveness. In many cases this can be linked to both national and international media, whose coverage of the debate surrounding vaccination will frequently lead to misunderstanding and mistrust of vaccination if not adequately accompanied by appropriate health education. This could be related to the finding that a lack of confidence may predict vaccine hesitancy. These emotions can interfere with an individual's motivation and willingness to adhere with preventative health behaviours like vaccination (Morgul et al., 2021; Wang et al., 2020); and may also increase an individual's likelihood to embrace misinformation (MacFarlane et al., 2020). These findings support the claims across a broad range of literature that suggest positive or negative attitudes towards vaccinations predict intention to uptake vaccination against COVID-19 (Paul et al., 2021; Sherman et al., 2021; Thunstrom et al., 2020). These findings suggest a causal link between attitudes and behaviour and should be explored further to explain how these attitudes and beliefs become established.

Results from the stratified analysis identified that unique to the Irish sample, individuals who were vaccine hesitant had increased COVID-19 severity and more negative vaccination attitudes. Whereas in the UK sample, those who were vaccine hesitant had a lack of perceived benefit regarding the vaccine. In comparison to those who were vaccine accepting; common contributors of vaccine hesitancy in both the Irish and UK sample were: increased perceived risk of the COVID-19 vaccine, and not having peers that viewed vaccination against COVID-19 as important. These findings may be due to concerns regarding the safety and side effects of available vaccines (Wang et al., 2020); or due to misinformation being spread about COVID-19 vaccination via social media platforms. The perceived safety of vaccination is identified repeatedly in the literature as a catalyst for vaccine hesitancy, with some individuals fearing that the vaccination is riskier than the virus itself (Karlsson et al., 2021; Neumann-Boehme et al., 2020). Conspiracy theories surrounding the vaccine have claimed that the vaccine can damage DNA (Ahuja and Bhaskar, 2021), and that the vaccine contains a chip that can monitor the public (Abbas et al., 2021). Similarly, misinformation regarding vaccination side-effects have also been prominent and may encourage vaccination hesitancy and resistance. For example, misinformation has claimed that the vaccine may cause miscarriage and infertility (Abbas et al., 2021). While the specific reasons for vaccine hesitancy were not explored in the present study, it can be assumed that fertility concerns may be a reason for such a high rate of hesitancy among younger women.

4.2. The psychological and behavioural profile of vaccine resistant individuals

Individuals who were vaccine resistant shared a similar psychological and behavioural profile to those who were vaccine hesitant. For example, regression modelling on the overall sample (UK and Ireland) identified that individuals who were vaccine resistant had increased perceived vaccine risk; had more negative vaccine attitudes; had low rates of civic responsibility; were less likely to have peers that viewed vaccination as important; and, were less likely to be influenced by their GP to vaccinate. Additionally, those who were vaccine resistant were more likely to view following public health guidelines as an act of 'choice' rather than an act of 'duty'. This underpins the challenge of creating an environment to lead people towards the 'healthiest' choice while allowing them to retain a sense of personal autonomy in health decisions. Similar patterns across both the Irish and UK samples were found, with factors such as: vaccination attitudes; not having peers who viewed vaccination as important; and not being influenced to vaccinate when encouraged by their GP, being identified as key predictors of vaccination. Thus, in conjunction with the vaccine hesitant group, social norms play a decisive role in vaccination intention. Consider here our data for external/social influences were single-item measures, and a degree of caution is required in interpreting these results. However, evidence suggest social norms can improve vaccination behaviour through increased civic responsibility (i.e., perceived duty or willingness to protect others) or as social pressure to vaccinate (Baeza-Rivera et al., 2021). International studies have demonstrated higher civic responsibility is associated with higher Covid-19 vaccination intentions in diverse samples (e.g., Kwok et al., 2021; Machida et al., 2021; Wismans et al., 2021). Several previous studies have highlighted the impact of social norms on the adoption of vaccines; for example, Allen et al. (2009) concluded that social norms (perceived behaviour of friends) were the strongest predictor of vaccination intention against human papillomavirus (HPV). Similarly, Parker et al. (2013) highlighted that social influence (peers being vaccinated) was the most prevalent reason for individuals to get vaccinated against the flu. Thus, peer influence magnifies the impact of social norms on behaviour and can be leveraged to promote a sense of civic responsibility (Yamin et al., 2019).

Regression modelling identified that unique to the Irish sample, individuals who were vaccine resistant had higher perceived vaccine risk and had lower civic responsibility. While those who were vaccine resistant in the UK sample, had reduced perceived vaccine benefit and less trust in authorities. These findings support the notion that vaccine beliefs, and attitudes towards authorities can negatively impact health behaviours (vaccination). The influence of trust in authoritative bodies on vaccination uptake is consistent with existing literature (e.g., Lee et al., 2016; Manika et al., 2014; Van der Weerd et al., 2011). Reflective of the current study's findings, results from an international study conducted by Crawshaw et al. (2021) found that mistrust in governments and public health agencies was linked to lower vaccination acceptance; while social influences (e.g., peers) can encourage vaccination. Research in the UK have supported these findings, and as a result; a digital intervention has been designed to prevent the negative effects of vaccine misinformation (Knight et al., 2021). This study developed a scalable digital intervention which sought to address the concerns of individuals who are vaccine hesitant with a view to enhancing their trust in COVID-19 vaccines and, in turn their uptake. Thus, these findings can be capitalized on by health promotion practitioners and other authoritative bodies to improve upon public trust in authorities, and to provide the best possible advice regarding one's health and to further enhance vaccine acceptance. Vaccine hesitancy can be shifted to vaccine acceptance if public health campaigns provide clear messages about the benefits, as well as clear information on the low risks associated with having the

vaccine and promote a positive sense of civic responsibility.

4.3. Implications for future vaccination campaigns

Findings from the current study highlight the importance of increasing vaccine confidence in the public and addressing misinformation. This could be accomplished through balancing risk and benefit information regarding the vaccine, as well as through targeting emotions and altruistic motivations by conveying the societal impact of an individual's decision to vaccinate. As highlighted in previous research, emotional appeals have been just as effective as statistical information at ensuring the success of health massaging and behaviour change (Betsch et al., 2011) – for example, fear appeals have been used to promote driving safety (Carey & Sarma, 2016). Thus, and in accordance with the current study's findings - which suggest that increased civic responsibility had a positive effect on an individual's intention to vaccinate- future vaccination strategies may benefit from appealing to altruism and the positive impact of vaccination on community. This kind of prosocial messaging has been found to elicit positive emotions (Bavel et al., 2020) and increased vaccine acceptance. For example, a study conducted by Jordan et al. (2020) found that messaging that promoted prosocial motivations was more successful at predicting intentions to engage in preventative behaviours than messaging that promoted personal motivations. Another recent study highlighted prosocial appeals increased willingness to practice preventative behaviours (Heffner et al., 2020). Thus, the use of value-concordant messaging, for example, frame vaccination as altruism could be instrumental in increasing vaccine acceptance. The Irish Government has launched a media campaign to do exactly this by using the hashtag #ForUsAll. Furthermore, due to the role played by social norms on intention to vaccinate; communication efforts intending to increase the uptake of the COVID-19 vaccine may benefit from adopting messaging that emphasizes the public's willingness to vaccinate against the virus. Relative to the role that peers play on hesitancy and resistance to vaccinate, potential strategies to combat these negative intentions may include positive peer pressure; where communication strategies utilize positive cues to action like encouragement from loved ones and trusted or admired figures (e.g., GP, social media influencers) (Lin et al., 2020). Reflective of this, is the positive effect that GP influence has on intention to vaccinate; with results indicating high rates of vaccine acceptance among those who were more likely to be influenced by GP advice. This is a discovery that can be and has been used to improve vaccination uptake. For example, within the UK and Ireland, steps that have been taken during the invitation stage of vaccine rollout have focused on GP engagement with patients. This allows those with concerns regarding the efficacy and safety of vaccine to communicate and address their concernment with a trusted medical professional (Danchin et al., 2020). This positive influence is observable in Israelis successful vaccination rollout which utilized their local medical teams as influential elements of the vaccine programmes (Rosen et al., 2021). Given the complexity of vaccine hesitancy, vaccination campaigns require multiple messages from a variety of trusted sources, including government, health authorities, scientific experts, community and religious leaders, social media companies, and celebrities. Truthful, transparent and consistent messaging is critical, particularly where trust in authorities is low (Jennings et al., 2021).

One of the more intriguing findings reported from this research was the correlates highlighted between adherence to public health guidelines and vaccine resistance and hesitancy in the UK sample. It can be assumed that these individuals might be managing their risk of COVID-19 behaviourally and therefore do not believe they need a vaccine to protect themselves further. Further research is necessary to explore these findings.

5. Strengths, limitations & future research

The current research is one of few studies conducted in the Republic of Ireland and the UK to empirically investigate the predictive factors of vaccination intent during a time when vaccination distribution was in progress. Despite providing some significant findings in the scope of research into vaccination uptake, it is also important to acknowledge the presence of limitations within the study that should be considered for future research prospects.

The results of the current study may not be generalisable to the wider population, as a large majority of the sample were females (79%), and of white ethnicity (93%). This is not representative of the gender split within the wider population, nor is it racially representative. Nevertheless, while the results are not representative of the general population, the reported vaccination intent (75%) is somewhat consistent with other reports of vaccination intent across the literature (Sherman et al., 2021; Chu et al., 2021; Malik et al., 2020). Additionally, two of our measures (perceived susceptibility and peer influence) demonstrated poor internal consistency. To minimise participant burden, we opted for a smaller number of items per scale, but the consequence of this is too few items for some of the measures to reach acceptable Cronbach's alpha levels. We suggest interpreting the results with this in mind, and recommend the use of additional items in future research.

Despite these limitations, it is clear from the research that intention to uptake vaccination is in some way linked to a range of attitudes and beliefs. These findings could prove useful to health promotion authorities in pointing their focus towards the factors that predict behavioural intent to enhance pro-vaccine attitudes and beliefs among citizens of the Republic of Ireland and the United Kingdom. To conclude, the present study has identified several predictive factors relating to intention to uptake vaccination to protect against COVID-19 in the Republic of Ireland and the UK. Despite its limitations, this study was successful in contributing to the existing body of literature surrounding COVID-19, and if applied practically, could enhance the promotion of vaccination uptake by improving upon the predictive factors of vaccination intent. Overall, the current research provided a richer understanding of vaccination intention in these nations.

CRediT authorship contribution statement

Jane Walsh: Conceptualization; Methodology; Supervision; Writing - review & editing. Miranda Comar: Data curation; Formal analysis; Investigation; Methodology; Project administration; Roles/Writing - original draft. Joy Folan: Data curation; Formal analysis; Investigation; Methodology; Project administration; Roles/Writing - original draft. Samantha Williams: Data curation; Formal analysis; Investigation; Methodology; Project administration; Roles/Writing - original draft. Susanna Kola-Palmer: Conceptualization; Methodology; Supervision; Writing - review & editing.

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Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.actpsy.2022.103550.

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