Covid-19 vaccine hesitancy and resistance amongst parents of children under 18 years of age in Ireland

Covid-19 Vaccine Hesitancy and Resistance Amongst Parents of Children Under 18 Years of Age in Ireland

The European Medicines Agency approved the Pfizer BioNTech COVID-19 vaccine for use in children aged 12 to 15 years on May 28th, 2021, and for those aged 5 to 11 years on November 25th, 2021. Achieving suppression of the virus in the community is therefore contingent on the safe and efficient delivery of vaccines to those under 18 years of age; a group that constitutes one quarter of the world's population. (1, 2) Additionally, the vaccination of children is recommended to ensure that schools and childcare facilities remain safely open and to minimise delays in accessing paediatric health services noted during the pandemic. (2, 3) Indeed, there is evidence that the closure of schools and associated activities had detrimental effects on children including educational disruption and reduced access to healthcare and nutritional supports. (4)

The World Health Organization defines vaccine hesitancy as refusing or delaying vaccine acceptance despite their availability. Recent years have seen an increase in parental vaccine hesitancy and misinformation (5), both of which are likely to complicate the rollout of COVID-19 vaccines to children. To date, studies suggest that parental acceptance of COVID-19 vaccines for their children is low in some countries, such as the UK (48.2%) (6), but higher overall globally (69.2%) (7). Factors associated with parental COVID-19 vaccine hesitancy and resistance include younger parental age, lower income, lower education, being a single parent, not having health insurance, concerns about the safety of the vaccines for children, recency of the vaccine, and low trust in scientists/scientific institutions and healthcare professionals. (7, 8) As COVID-19 vaccines become available to most, if not all, children in the coming months, it is critical to understand (a) how willing parents are to vaccinate their children against COVID-19, and (b) what factors are associated with parental hesitancy and resistance towards COVID-19 vaccination for their children.

Methods

This study used data from the Irish arm of the COVID-19 Psychological Research Consortium (C19PRC) study, a multi-national longitudinal population survey study examining the psychosocial impacts of the pandemic on the general adult population. (9) All data were collected by the survey company Qualtrics. Data used in this study was collected at Wave 5, March/April 2021 (N = 1,100). The full data collection strategy was previously described by Skipol et al. (2021). (10) Participants were recruited from existing research panels, with quota sampling methods used to construct a non-probability-based sample representative of the general adult population of the Republic of Ireland in terms of sex, age, and geographical distribution. Previous research demonstrates that these data are representative of the Irish population on all quota variables and are highly representative of the population across many other sociodemographic variables. (10) To take part, participants had to be aged 18 years or older, resident in Ireland, and capable of completing the survey in English. Participants were remunerated by Qualtrics (amount unspecified), and informed consent was obtained electronically. Ethical approval was granted by Maynooth University [SRESC-2020-2402202]. Of the 1,100 participants contacted at Wave 5, 43.8% (n = 482) stated that they were a parent of a child under the age of 18. This subsample of parents was used for all analyses, and their sociodemographic details are provided in Table 1. It should be noted that childhood age was not collected.

Table 1 here

Parental willingness to vaccinate their child was assessed by asking: "*Multiple vaccines for COVID-19 have now been developed. Will you give your child a vaccine for COVID-19 when it becomes available?*". Those who answered "Yes" or "My child has already been vaccinated" were classified as vaccine accepting; those who answered "Maybe" were categorised as vaccine hesitant; and those who answered "No" were categorised as

vaccine resistant. In addition to the demographic variables listed in Table 1, participants were also asked to rate their trust in scientists and doctors with each measured on a five-point Likert scale ranging from 'Do not trust at all' (1) to 'Completely trust' (5). Participants were also asked to indicate their belief in five common false ideas about the COVID-19 vaccines and four common negative beliefs about healthcare professionals and doctors (see Table 2 for details). Participants indicated their belief in each statement using a 0-100 slider scale, where higher scores indicate stronger false or negative beliefs.

Unique associations between all variables listed in Table 2 and parental vaccine hesitancy and resistance were assessed using a multinomial logistic regression analysis, with the vaccine accepting group set as the reference category (i.e., the vaccine hesitant and vaccine resistant groups were compared to the vaccine accepting group). All associations are expressed as adjusted odds ratios (AOR), and analyses were conducted in SPSS v26.

Results

In total, 52.1% (n=251) of parents had or intended to have their child(ren) vaccinated; 30.1% (n=145) were hesitant to vaccinate their child(ren); and 17.8% (n=86) were resistant to vaccinating their child(ren). The multinomial logistic regression model was statistically significant (χ^2 (68, n = 479) = 274.23, p < .001), and the results are presented in Table 2.

Table 2 here

Variables significantly associated with being *hesitant* to vaccinating one's child(ren) included younger parental age (AOR=0.97), lower education levels (AORs ranged from 2.43 to 4.41), lower income level (AOR=0.75), not knowing someone who had been sick with COVID-19 (AOR=0.47), stronger beliefs that the vaccines are not safe due to their rapid development (AOR=1.02), their potential to damage fertility (AOR=1.02), and stronger beliefs that scientists and healthcare workers often cover up their mistakes (AOR=1.02).

Variables significantly associated with being *resistant* to vaccinating one's child(ren) included younger parental age (AOR=0.96), living alone (AOR=4.41), having less trust in scientists (AOR=0.64), weaker beliefs that the vaccines contain a microchip (AOR=0.96), stronger beliefs that the vaccines are not safe due to their rapid development (AOR=1.03), and stronger beliefs that they may damage fertility (AOR=1.02).

Discussion

As of the first quarter of 2021, approximately half of parents in Ireland with children under 18 years had or were intending to have their child(ren) vaccinated against COVID-19, one-in-three parents expressed hesitancy, and nearly one-in-five expressed resistance to vaccinating their child(ren). While similar to findings from the UK, which found that 48.2% of parents would accept a vaccine for their child(ren), (6) parental COVID-19 vaccine acceptance for children in Ireland was relatively low compared to findings from other countries, including one study from 16 nations that estimated parental/caregiver vaccine acceptance for children at 69.2%. (7)

Earlier studies probing the adult population in Ireland about their own COVID-19 vaccine intentions prior to the arrival of the vaccines, found that 60-65% of people were vaccine accepting (i.e., answered 'Yes' to the same type of question posed here) and another 23-25% were vaccine hesitant (i.e., answered 'Maybe'). (11, 12) Despite these initially worrying findings, *actual* uptake of COVID-19 vaccination in Ireland, however, has been extremely high, with over 90% of the eligible population now fully vaccinated, with 2 doses, and the booster programme in progress. (13) As such, it appears that almost all people who expressed hesitancy in advance of the vaccine rollout subsequently accepted the vaccine for themselves. This offers encouragement that many (or perhaps all) of those parents who expressed hesitancy about vaccinating their child will eventually choose to vaccinate their children once the vaccines are available, and approved for their children's age groups by the

relevant medical agencies. Indeed, as of mid-December 2021, the current uptake rate in the 12 to 15-year-old age group in Ireland stands at 67.7%. (13)

The demographic factors associated with parental COVID-19 vaccine hesitancy and resistance in this study were strikingly similar to findings from the wider literature, including younger parental age (7, 14), lower education level (7, 15), lower income (6, 7), and living alone (7) all associated with being hesitant and/or resistant to childhood vaccination. Additionally, knowing someone close to you who had been sick with COVID-19 was significantly associated with reduced parental vaccine hesitancy (though not vaccine resistance). Public health campaigns aimed at increasing COVID-19 vaccine uptake in children should therefore target younger parents, delivering important scientific information about the safety and efficacy of the vaccines in a clear, concise, and jargon-free manner, aimed towards those in lower socioeconomic status groups. Moreover, as knowing somebody who was infected by COVID-19 is an important factor in decreasing hesitancy, it may be that parental willingness to vaccinate their children will increase as more transmissible variants (i.e. Delta and Omicron) move through the population.

In the extant literature concerns around safety and the rapid development of COVID-19 vaccines were frequently cited reasons for parental COVID-19 vaccine hesitancy and resistance, (6, 7, 16, 17). Similarly in the current sample beliefs about the safety profile of the COVID-19 vaccines were related to parental hesitancy and resistance. Specifically, vaccine hesitant and resistant parents were more likely to believe that COVID-19 vaccines are unsafe due to their rapid development, and that they can damage fertility.

Perhaps most importantly, however, concerns about vaccines among the hesitant and resistant cohorts are less conspiratorial than the popular narrative may suggest. Unusual beliefs regarding the vaccine which abound in the media, such as the vaccines altering DNA, or containing a microchip (18) did not surface in this study, or in the published literature, as

significant correlates of vaccine hesitancy or resistance. This suggests that the popular narrative that vaccine resistant groups hold very odd beliefs and/or believe in conspiracy theories does not hold true for a majority of vaccine resistant parents in Ireland. In addition, the vaccine resistant group may also be more movable than is suggested in the literature for other populations.

Based on these findings, public health messaging should focus on explaining how the COVID-19 vaccines were developed; demonstrating the steps taken to evidence their safety and effectiveness, and communicating that, while these steps may have been compressed, none were omitted. Moreover, clear and easy-to-understand explanations of how there is no likely mechanism by which the vaccines can affect male or female fertility should also be offered to the public to counter these commonly held false beliefs. Finally, dismissing the concerns of those who are vaccine hesitant or resistant as 'conspiratorial' is unlikely to promote trust and acceptance.

Our findings are important as they suggest that vaccine hesitant and vaccine resistant groups in Ireland share more similar beliefs regarding vaccines than previously thought, or at least than cited in the literature. (5) This has significant implications for public health campaigns, in terms of potentially being able to target both groups simultaneously, rather than requiring different messaging and approaches for each cohort, as has previously been postulated. (19)

Vaccine resistant parents were, however, significantly less likely to have trust in scientists than vaccine accepting parents, distinguishing the two groups. Similarly, in the literature, less trust in scientists was associated with being less likely to accept a vaccine for oneself or those in one's care. (7, 20) This implies that a similar message could be delivered to these two groups but in different modalities. Specifically, due consideration should be given to *who* delivers public health messaging around vaccines. For example, whereas the

hesitant group may benefit from prominent scientists delivering the message clearly and simply, the resistant group may have more trust in messaging delivered by prominent members of their local community (e.g., religious leaders), peers, online influencers, parenting groups, or celebrities.

This study had a number of limitations. Firstly, the sample was a non-probability based sample which reduces the generalisability of the results. Second, we did not measure the age of the children, as a potential determinant of parental hesitancy or resistance. Finally, the timing of the study may have impacted the results given that the survey was completed before vaccines were approved for children aged 12 years and older in the European Union. Despite these limitations, this study provides important information about the willingness of parents to vaccinate their children, and the factors associated with unwillingness, in a nation with one of the highest rates of COVID-19 vaccination in the world. This information may be beneficial for public health authorities nationally and internationally as they prepare to communicate to the public about the value and importance of childhood vaccination against COVID-19.

Funding: This research received funding from the Health Research Board and the Irish Research Council under the COVID-19 Pandemic Rapid Response Funding Call [COV19-2020-025].

Data Sharing Statement: All data used in this study is freely available at https://osf.io/c57fp/

Conflicts of Interest: None

References:

1. Zimet GD, Silverman RD, Fortenberry JD. Coronavirus disease 2019 and vaccination of children and adolescents: prospects and challenges. The Journal of pediatrics. 2021;231:254-8. https://doi.org/10.1016/j.jpeds.2020.11.002

2. Zimmermann P, Pittet LF, Finn A, Pollard AJ, Curtis N. Should children be vaccinated against COVID-19? Archives of Disease in Childhood. Published Online First: 03 November 2021. https://doi.org/10.1136/archdischild-2021-323040

3. McDonnell T, Nicholson E, Conlon C, Barrett M, Cummins F, Hensey C, et al. Assessing the Impact of COVID-19 Public Health Stages on Paediatric Emergency Attendance. Paediatric Emergency Attendance. Int J Environ Res Public Health. 2020;17(18):6719. https://doi.org/10.3390/ijerph17186719

4. UNESCO. Adverse consequences of school closures Paris: UNESCO; 2021, https://en.unesco.org/covid19/educationresponse/consequences [accessed 9 December 2021].

5. Shen SC, Dubey V. Addressing vaccine hesitancy: Clinical guidance for primary care physicians working with parents. Canadian family physician Medecin de famille canadien. 2019;65(3):175-81.

6. Bell S, Clarke R, Mounier-Jack S, Walker JL, Paterson P. Parents' and guardians' views on the acceptability of a future COVID-19 vaccine: A multi-methods study in England. Vaccine. 2020;38(49):7789-98. https://doi.org/ 10.1016/j.vaccine.2020.10.027

7. Skjefte M, Ngirbabul M, Akeju O, Escudero D, Hernandez-Diaz S, Wyszynski DF, et al. COVID-19 vaccine acceptance among pregnant women and mothers of young children: results of a survey in 16 countries. Eur J Epidemiol. 2021;36(2):197-211. https://doi.org/10.1007/s10654-021-00728-6

8. Sturgis, P., Brunton-Smith, I. & Jackson, J. Trust in science, social consensus and vaccine confidence. Nat Hum Behav 2021; 5, 1528–1534. https://doi.org/10.1038/s41562-021-01115-7

9. McBride, O., Butter, S., Hartman, T. K., Murphy, J., Hyland, P., Shevlin, M., Gibson-Miller, J., Levita, L., Mason, L., Martinez, A. P., McKay, R., Lloyd, A., Stocks, T. V. A., Bennett, K. M., Vallières, F., Karatzias, T., Valiente, C., Vazquez, C., Contreras, A., Bertamini, M., Panzeri, A., & Bruno, G. (2021). Sharing data to better understand one of the world's most significant shared experiences: An overview of the openly accessible COVID-19 Psychological Research Consortium (C19PRC) Study data. International Journal of Population Data Science [In press].

10. Spikol E, McBride O, Vallières F, Butter S, Hyland P. Tracking the Irish adult population during the first year of the COVID-19 pandemic: A methodological report of the COVID-19 psychological research consortium (C19PRC) study in Ireland. Acta Psychologica. 2021;220:103416. https://doi.org/10.1016/j.actpsy.2021.103416

11. Murphy J, Vallières F, Bentall RP, Shevlin M, McBride O, Hartman TK, et al. Psychological characteristics associated with COVID-19 vaccine hesitancy and resistance in Ireland and the United Kingdom. Nature Communications. 2021;12(1):29. https://doi.org/10.1038/s41467-020-20226-9

12. Hyland P, Vallières F, Shevlin M, Bentall RP, McKay R, Hartman TK, et al. Resistance to COVID-19 vaccination has increased in Ireland and the United Kingdom during the pandemic. Public Health. 2021;195:54-6. https://doi.org/10.1016/j.puhe.2021.04.009

13. Health Protection Surveillance Centre. COVID-19 Vaccine Uptake in Ireland Weekly Reports: https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/vaccination/covid-19vaccinationuptakereports/

[accessed 23 December 2021]

14. Kelly BJ, Southwell BG, McCormack LA, Bann CM, MacDonald PDM, Frasier AM, et al. Predictors of willingness to get a COVID-19 vaccine in the U.S. BMC Infectious Diseases. 2021;21(1):338. https://doi.org/10.1186/s12879-021-06023-9

15. Rhodes ME, Sundstrom B, Ritter E, McKeever BW, McKeever R. Preparing for A COVID-19 Vaccine: A Mixed Methods Study of Vaccine Hesitant Parents. Journal of Health Communication. 2020;25(10):831-7. https://doi.org/10.1080/10810730.2021.1871986

16. Akarsu B, Canbay Özdemir D, Ayhan Baser D, Aksoy H, Fidancı İ, Cankurtaran M. While studies on COVID-19 vaccine is ongoing, the public's thoughts and attitudes to the future COVID-19 vaccine. Int J Clin Pract. 2021;75(4):e13891. https://doi.org/10.1111/ijcp.13891

17. Zhou Y, Zhang J, Wu W, Liang M, Wu Q-S. Willingness to receive future COVID-19 vaccines following the COVID-19 epidemic in Shanghai, China. BMC Public Health. 2021;21(1):1103. https://doi.org/10.1186/s12889-021-11174-0

18. McEvoy J. Microchips,Magnets and Shedding:Here are 5 (debunked) covid vaccine conspiracy theories spreading online 2021, https://www.forbes.com/sites/jemimamcevoy/2021/06/03/microchips-and-shedding-here-are-5-debunked-covid-vaccine-conspiracy-theories-spreading-online/?sh=279e9a9626af [accessed 18 December 2021]

19. Neumann-Böhme S, Varghese NE, Sabat I, Barros PP, Brouwer W, van Exel J, et al. Once we have it, will we use it? A European survey on willingness to be vaccinated against COVID-19. Eur J Health Econ. 212020. p. 977-82. https://doi.org/0.1007/s10198-020-01208-6

20. Viswanath K, Bekalu M, Dhawan D, Pinnamaneni R, Lang J, McLoud R. Individual and social determinants of COVID-19 vaccine uptake. BMC Public Health. 2021;21(1):818. https://doi.org/10.1186/s12889-021-10862-1

250 Table 1

251 *Sociodemographic characteristics of all parents with children under 18 years (N = 482)*

	%
Sex	
Male	48.1
Female	51.9
Age	
18-24	7.9
25-34	23.7
35-44	32.8
45-54	22.4
55-64	9.3
65 +	3.9
Province	
Leinster	58.5
Munster	24.9
Connaught	11.6
Ulster	5.0
Ethnicity	
Irish	78.4
Non-Irish	21.6
Born in Republic of Ireland	
Yes	74.7
No	25.3
Urbanicity	
Rural, suburb, town	72.4
City	27.6
Education	
No qualification	0.6
Junior Certificate or Equivalent	4.1
Leaving Certificate of Equivalent	18.0
Technical qualification	10.8
Diploma/Other	15.8
Undergraduate degree	28.8
Postgraduate degree	21.8
Lives Alone	
Yes	7.7
No	92.3
Religion	
Atheist/Agnostic	13.5
Religious	86.5
Approximate Gross Salary	
< €20,000	27.0
€20,000- €29,999	19.9

€30,000-€39,999	18
€40,000-€49,999	14.3
€50,000 or more	20.8
Employment	
Unemployed	20.5
Retired	5.0
Employed	74.5
Underlying physical health issue	
Yes	22.8
No	77.2
History of Mental Health problem	
Yes	30.1
No	69.9
Pregnant/Partner pregnant	
Yes	8.9
No	91.1
Have you been diagnosed with a confirmed case COVID-19?	
Yes	6.2
No/Not confirmed	93.8
Were you admitted to hospital with COVID-19?	
Yes	1.2
No	98.8
Anyone close to you been sick with COVID-19?	
Yes	28.8
No	71.2
Has anyone close to you died with COVID-19?	
Yes	9.5
No	90.5

Table 2

Multinomial logistic regression results of the unique associations between all predictor variables and parental hesitance and resistance to COVID-19 vaccination of their child.

	Hesitant			Resistant		
	B	***p***	**AOR (95% CI)**	**B**	***p***	**AOR (95% CI)**
Male (reference = female)	-0.06	0.818	0.94 (0.54, 1.63)	-0.10	0.787	0.90 (0.43, 1.89)
Age	**-0.03**	**0.013**	**0.97 (0.94, 0.99)**	**-0.04**	**0.037**	**0.96 (0.93, 0.99)**
Irish ethnicity (reference = non-Irish ethnicity)	0.34	0.543	1.40 (0.47, 4.14)	0.98	0.187	2.67 (0.62, 11.48)
Irish nationality (reference = non-Irish nationality)	-0.06	0.254	0.55 (0.20, 1.54	-0.88	0.214	0.42 (0.10, 1.66)
Lives in a rural, suburb, town (reference = lives in a city)	-0.27	0.393	0.77 (0.47, 4.14)	-0.45	0.255	0.64 (0.29, 1.38)
Education (reference = postgraduate qualification)						
No qualification	0.60	0.722	1.82 (0.07, 49.16)	0.52	0.789	1.66 (0.41, 67.27)
Junior Certificate or equivalent	**1.49**	**0.049**	**4.41 (1.01, 19.26)**	0.51	0.614	1.67 (0.23, 12.08)
Leaving Certificate or equivalent	**0.89**	**0.037**	**2.43 (1.05, 5.63)**	0.34	0.546	1.40 (0.47, 4.23)
Technical qualification	**1.30**	**0.008**	**3.66 (1.40, 9.54)**	0.72	0.251	2.04 (0.60, 6.92)
Diploma/Other	0.17	0.708	1.18 (0.49, 2.87)	0.08	0.895	1.08 (0.35, 3.31)

Undergraduate degree	0.39	0.289	1.48 (0.72, 3.07)	0.11	0.817	1.12 (0.43, 2.92)
Lives Alone	0.56	0.285	1.75 (0.63, 4.93)	**1.48**	**0.011**	**4.41 (1.40, 13.89)**
Religious	0.27	0.484	1.31 (0.61, 2.83)	0.02	0.965	1.02 (0.37, 2.79)
Salary	**-0.28**	**0.008**	**0.75 (0.61, 0.93)**	-0.22	0.125	0.81 (0.61, 1.06)
Employment (reference = employed)						
Unemployed	-0.05	0.876	0.95 (0.48, 1.86)	-0.01	0.981	0.99 (0.41, 2.42)
Retired	-1.01	0.164	0.36 (0.09, 1.51)	-1.86	0.147	0.16 (0.01, 1.93)
Underlying physical health issue	-0.32	0.351	0.73 (0.37, 1.42)	0.05	0.904	1.05 (0.44, 2.54)
History of mental health problem	0.04	0.885	1.04 (0.59, 1.85)	-0.58	0.155	0.56 (0.25, 1.24)
Pregnant/Partner pregnant	-0.30	0.534	0.74 (0.29, 1.92)	0.06	0.914	1.07 (0.34, 3.37)
Diagnosed with a confirmed case COVID-19	-1.15	0.104	0.32 (0.08, 1.27)	0.19	0.785	1.21 (0.31, 4.74)
Admitted to hospital with COVID-19	1.92	0.151	6.84 (0.50, 94.20)	1.13	0.459	3.11 (0.16, 62.18)
Someone close to you been sick with COVID-19	**0.75**	**0.013**	**0.47 (0.26, 0.85)**	-0.46	0.259	0.63 (0.29, 1.40)
Someone close to you died with COVID-19	-0.97	0.061	0.38 (0.14, 1.05)	-0.91	0.148	0.40 (0.12, 1.38)
Trust in scientists	-0.19	0.246	0.83 (0.60, 1.14)	**-0.44**	**0.028**	**0.64 (0.43, 0.95)**
Trust in doctors	0.05	0.772	1.05 (0.75, 1.47)	0.03	0.881	1.03 (0.69, 1.55)
Belief that the COVID-19 vaccine…						
Contain a microchip	-0.02	0.099	0.98 (0.97, 1.00)	**-0.04**	**0.001**	**0.96 (0.94, 0.98)**

Will alter your DNA	0.01	0.489	1.01 (0.99, 1.01)	0.02	0.234	1.02 (0.99, 1.04)
Will give you COVID-19	-0.01	0.373	0.99 (0.98, 1.01)	-0.00	0.892	1.00 (0.98, 1.02)
Not safe as rapidly developed	**0.02**	**0.001**	**1.02 (1.01, 1.04)**	**0.03**	**<0.001**	**1.03 (1.02, 1.05)**
Can damage fertility	**0.02**	**0.015**	**1.02 (1.01, 1.03)**	**0.02**	**0.017**	**1.02 (1.00, 1.04)**
Belief that scientists and healthcare practitioners…						
Often deceive or mislead the public	-0.00	0.833	1.00 (0.98, 1.02)	0.01	0.594	1.01 (0.99, 1.03)
Often cover up their mistakes	**0.02**	**0.030**	**1.02 (1.00, 1.03)**	0.02	0.055	1.02 (1.00, 1.04)
Are more concerned with making money than taking care of people	-0.01	0.509	1.00 (0.98, 1.01)	0.00	0.956	1.00 (0.98, 1.02)
Don't know what they are doing	-0.01	0.203	0.99 (0.98, 1.01)	-0.00	0.810	1.00 (0.98, 1.02)

Note: B = unstandardized beta value; p = statistical significance value; AOR (95% CI) = adjusted odds ratio with 95% confidence intervals; statistically significant associations ($p < .05$) are highlighted in bold.