COVID-19 Vaccine Acceptance Among US Parents: A Nationally Representative Survey

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Background. Little was known about US parental attitudes, beliefs, and intentions surrounding coronavirus disease 2019 (COVID-19) vaccines for children before their introduction.

Methods. An online cross-sectional nationally representative survey of US parents/guardians of children < 18 years old via Ipsos KnowledgePanel, fielded from October 26, 2021 to November 30, 2021.

Results. Response rate was 64.2% (3230/5034). For children ages 0–4 years, 51.5% of parents were likely to have their children vaccinated, and for ages 5–11 and 12–17, 54.0% and 69.7% of parents, respectively, reported they were likely to vaccinate or had already vaccinated their children. Among respondents with unvaccinated children, 25.2% (ages 0–4) and 22.0% (ages 5–11) reported they would seek COVID-19 vaccination for their children as soon as authorization occurred. Factors associated with willingness to have children receive a COVID-19 vaccine were: belief in benefits of COVID-19 vaccination (odds ratio [OR] = 6.44, 5.68, 4.57 in ages 0–4, 5–11, and 12–17, respectively), acceptance of routine childhood vaccines (OR = 6.42, 5.48, 1.76), parental COVID-19 vaccination (OR = 1.85, 3.70, 6.16), perceptions that pediatric COVID-19 is severe (OR = 1.89, 1.72, 1.35), Hispanic ethnicity (OR = 2.07, 2.29, 2.60), influenza vaccine acceptance (OR = 1.07, 0.88, 1.62), presence of children of another age group in the household (OR = 0.71, 0.71, 0.65), and attitudinal barriers to COVID-19 vaccination (OR = 0.30, 0.26, 0.49).

Conclusions. Belief in the benefits of COVID-19 vaccination and acceptance of routine childhood vaccines are the strongest predictors of intention to vaccinate children. Further research is needed to track how parental attitudes change as more data about pediatric COVID-19 vaccines become available and how intentions translate into pediatric vaccine uptake.

Key words: COVID-19, immunization, pediatrics, SARS-CoV-2, vaccines, vaccine hesitancy, vaccine acceptance.

INTRODUCTION

As of May 10, 2022, the United States (US) has reported >81 million coronavirus disease 2019 (COVID-19) cases and 990 000 COVID-19-related deaths, with >12.6 million cases and 1500 deaths in children <18 years old [1]. Pediatric severe acute respiratory syndrome coronavirus two (SARS-CoV-2)-related disease ranges from mild cold-like symptoms to severe manifestations, such as multi-organ failure and multisystem inflammatory syndrome in children (MIS-C) [2]. As of May 10, 2022, the United States (US) has reported >81 million coronavirus disease 2019 (COVID-19) cases and

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COVID-19 Vaccine Acceptance Among US Parents • JPIDS 2022:11 (August) • 361
Postal Service's Delivery Sequence File. Stratified random sampling (ABS) recruitment methodology based on the US population (Supplement 2). Ipsos uses an address-based probability-based web panel designed to be representative of the US adult population [12]. The Ipsos KnowledgePanel supplements traditional ABS using dual-frame random-digit-dialing sampling to recruit a Spanish-language-dominant Hispanic sample [13]. All panel members are provided privacy and confidentiality protections. If needed, Ipsos provides a web-enabled device and free internet service.

Sample Selection
These analyses use a composite sample constructed from (1) a longitudinal sample with Wave 1 collected in February 2021 and Wave 2 in October/November 2021 and (2) an add-on sample of respondents who did not complete the Wave 1 survey, collected October/November 2021. Both samples were selected using the equal probability selection method. We sampled panel members expected to meet inclusion criteria based on their KnowledgePanel profiles.

Survey Administration
We fielded the survey in English and Spanish. Eligible panel members received an email invitation followed by reminders with a $5–10 incentive upon survey completion.

Data Cleaning
We cleaned from the final data set all responses completed in <25% of the median survey completion time, responses wherein panel members skipped ≥50% of eligible questions, and responses wherein reported age and sex did not match panel enrollment demographics. Seven responses were excluded due to responses on screening questions about child age that triggered incorrect skip logic for the remainder of the survey. Overall, 40 respondents were removed before weighting, leaving a final sample of 3042 respondents.

Weighting
Design weights for the longitudinal and add-on samples were produced separately and then combined into a final weight for the pooled cross-sectional sample. The design weights were produced using an iterative proportional fitting (raking) procedure and parent demographic benchmarks from the 2019 American Community Survey and the 2020 March Supplement of the Current Population Survey. The longitudinal and add-on samples were combined based on their effective sample sizes and raked to the population geodemographic distributions of parents who are healthcare decision-makers for children <18 years old. The resulting weights were trimmed and scaled to add up to the total number of qualified respondents to produce final weights for these analyses (detailed weighting methods in Supplement 2).

Statistical Methods
All analyses reported in this paper are cross-sectional and represent the Wave 2 responses of the combined longitudinal and add-on sample.
### Table 1. Survey Respondent Characteristics

| Characteristic                                      | N  | Weighted n | Weighted % (SE) |
|-----------------------------------------------------|----|------------|-----------------|
| **Age (years)**                                     |    |            |                 |
| 18–34                                               | 608| 908.3      | 29.9 (1.1)      |
| 35–44                                               | 1390| 1254.5     | 41.2 (1.0)      |
| 45–54                                               | 835 | 714.4      | 23.5 (0.8)      |
| ≥ 55                                                | 209 | 164.7      | 5.4 (0.4)       |
| **Age(s) of child(ren) (years)**                    |    |            |                 |
| 0–4                                                 | 950| 1109.7     | 36.5 (1.1)      |
| 5–11                                                | 1613| 1622.4     | 53.3 (1.1)      |
| 12–17                                               | 1620| 1523.0     | 50.1 (1.1)      |
| Presence of child(ren) of other age group(s) in household |    |            |                 |
| No                                                  | 1994| 1941.8     | 63.8 (1.0)      |
| Yes                                                 | 1048| 1100.2     | 36.2 (1.0)      |
| **Number of children in household**                 |    |            |                 |
| 1                                                   | 1230| 1226.4     | 40.3 (1.0)      |
| 2                                                   | 1179| 1149.9     | 37.8 (1.0)      |
| 3                                                   | 436 | 458.1      | 15.1 (0.8)      |
| ≥ 4                                                 | 197 | 2076       | 6.8 (0.6)       |
| **Sex**                                             |    |            |                 |
| Male                                                | 1326| 1363.6     | 44.8 (1.1)      |
| Female                                              | 1716| 1678.4     | 55.2 (1.1)      |
| **Race**                                            |    |            |                 |
| White                                               | 2508| 2330.9     | 76.6 (1.0)      |
| Black                                               | 230 | 362.3      | 11.9 (0.8)      |
| American Indian/Alaskan Native                      | 27 | 42.5       | 1.4 (0.3)       |
| Asian/Native Hawaiian/Pacific Islander              | 161 | 221.8      | 7.3 (0.8)       |
| ≥2 races                                            | 116 | 84.5       | 2.8 (0.3)       |
| **Ethnicity**                                       |    |            |                 |
| Not Spanish, Hispanic, or Latino                    | 2521| 2381.1     | 78.3 (0.9)      |
| Spanish, Hispanic, or Latino                        | 521 | 660.9      | 21.7 (0.9)      |
| **Education level**                                 |    |            |                 |
| Less than high school degree                        | 195 | 324.5      | 10.7 (0.8)      |
| High school degree                                  | 525 | 690.4      | 22.7 (1.0)      |
| Some college or Associate degree                    | 751 | 892.4      | 29.3 (1.0)      |
| Bachelor’s degree or higher                         | 1571| 1134.7     | 37.3 (1.0)      |
| **Employment status**                               |    |            |                 |
| Employed                                            | 2392| 2335.1     | 76.8 (0.9)      |
| Unemployed                                          | 650 | 706.9      | 23.2 (0.9)      |
| **Healthcare worker**                               |    |            |                 |
| No                                                  | 2715| 2741.5     | 90.4 (0.6)      |
| Yes                                                 | 317 | 290.1      | 9.6 (0.6)       |
| Nurse                                               | 79 | 73.6       | 25.9 (3.0)c     |
| Advanced practice provider (ie, NP, PA)             | 18 | 13.3       | 4.7 (1.2)c      |
| Physician                                           | 17 | 15.3       | 5.4 (1.4)c      |
| Other                                               | 198 | 182.1      | 64.0 (3.2)c     |
| **Annual household income**                         |    |            |                 |
| < $25 000                                           | 288 | 268.3      | 8.8 (0.6)       |
| $25 000–$74 999                                     | 871 | 972.3      | 32.0 (1.0)      |
| ≥ $75 000                                           | 1883| 1801.3     | 59.2 (1.1)      |
| **Census region**                                   |    |            |                 |
| Northeast                                           | 463 | 501.0      | 16.5 (0.8)      |
| Midwest                                             | 763 | 641.8      | 21.1 (0.8)      |
| South                                              | 1041| 1158.3     | 38.1 (1.1)      |
| West                                               | 775 | 740.9      | 24.4 (0.9)      |
| **Urbanicity**                                      |    |            |                 |
| Urban                                               | 945 | 968.6      | 31.9 (1.0)      |
| Rural                                               | 520 | 507.1      | 16.7 (0.8)      |
| Suburban                                            | 1575| 1664.7     | 51.5 (1.1)      |
samples using the final weights. We summarized respondent characteristics by counts, weighted counts, weighted proportions, and corresponding linearized standard errors for categorical variables. We reverse-coded negatively worded questions as applicable.

The primary outcomes were parental COVID-19 vaccine acceptance for children ages 0–4, 5–11, and 12–17, which we dichotomized as “already received or very/somewhat likely” versus “somewhat/very unlikely” for each age group. The VHS was included as a single variable using a composite score; the average of answers for each participant was calculated, and a score of >3 was deemed “not accepting” [9]. We calculated the weighted Cronbach’s alpha (α) to ensure additional and edited questions did not compromise the internal consistency of the VHS.

We examined responses to items designed to reflect the prespecified Health Belief Model domains and used weighted Cronbach’s α to evaluate internal consistency for each domain. An average composite score was calculated for the domains with Cronbach’s α ≥ 0.7 for use in subsequent analyses.

For each age group, the bivariate analysis examined the unadjusted association between each predictor of interest and the primary binary outcome. Three separate series of weighted multiple logistic regressions identified statistically significant, independently predictive factors for parental willingness for COVID-19 vaccination of children ages 0–4, 5–11, and 12–17 using a common set of predictors. The final set of common predictors by age group (0–4, 5–11, and 12–17) was determined using a multi-step process. First, we identified a best-fitting model for each age group using a base set of 27 predictors. We dropped variables showing a high level of multicollinearity (variance inflation factor ≥ 10) and then used backward stepwise model selection based on the Bayesian information criterion. Finally, predictors identified in one or more of the final age-specific best-fitting models were combined into a set of cross-group predictors. All analyses were conducted in R-4.1.2 for Windows using packages “survey” and “MASS” [14–17].

**RESULTS**

Response rate was 64.2% (3230/5034); 3042 responses qualified for analysis after data cleaning (1511 longitudinal sample respondents and 1571 add-on sample respondents). The sample size for the primary outcome differed with 950, 1613, and 1620 responses for parents with children ages 0–4, 5–11, and 12–17, respectively. Two respondents did not complete...
the primary outcome questions for children ages 5–11 and were excluded. Table 1 presents respondent characteristics (Supplemental Table 1 includes nonrespondents). The modified VHS had Cronbach’s α = 0.91.

Parental Attitudes and Beliefs About SARS-CoV-2-Related Disease and COVID-19 Vaccines

Supplemental Table 2 presents respondents’ attitudes and beliefs about SARS-CoV-2-related disease and COVID-19 vaccines. 83.1% of parents agreed it would be bad if their children got COVID-19, and 81.2% of parents were concerned about how new variants could affect children. Of the 31.5% who had heard of MIS-C, 96.3% agreed it would be bad if their children got MIS-C, while 80.3% were worried about the possibility of their children getting MIS-C. 89.4% agreed their children’s healthcare provider is a reliable and trustworthy source of information about COVID-19 vaccines. 80.1% and 81.5% agreed they were worried about serious and rare vaccine side effects, respectively. 67.5% agreed that COVID-19 vaccines were developed too quickly. 51.1% agreed that most children do not need a COVID-19 vaccine, and 62.1% agreed the vaccines might not work to prevent COVID-19 in children. Composite scores grouping questions by attitude/belief domains were confirmed to be internally reliable (Figure 1).

Parental Acceptance of COVID-19 Vaccines for Children

The percentage of parents who were very/somewhat likely to have their children vaccinated or whose children were already vaccinated against COVID-19 was 51.5% for ages 0–4, 54.0% for 5–11, and 69.7% for 12–17 (Figure 2a). Among respondents with an unvaccinated child < 12 years, 25.2% (ages 0–4) and 22.0% (ages 5–11) reported they would seek COVID-19 vaccination for their children as soon as pediatric authorization occurred, and larger proportions of respondents reported wanting to wait until other children were vaccinated or not being comfortable letting their child receive a COVID-19 vaccine (Figure 2b).

Characteristics of Parents Who Reported Willingness to Vaccinate Their Child Against COVID-19

Our final multivariable models contained eight predictors that were significant in at least one of the age-specific best-fitting models (Figure 3; see Supplemental Table 3 for bivariate associations, Supplemental Table 4 and Supplemental Figure 1 for age-specific best-fitting models, and Supplemental Table 5 for all predictors included in the final models). The strongest positive predictors of parental likelihood to vaccinate children across all age groups were belief in the benefits of COVID-19 vaccination and acceptance of routine childhood vaccinations.
Positive predictors also included perception that pediatric COVID-19-related disease is severe for children ages 0–4 and 5–11, Hispanic ethnicity and parental COVID-19 vaccination for ages 5–11 and 12–17, and 2019–2020 influenza vaccine uptake for ages 12–17. The strongest negative predictor across all age groups was attitudinal barriers to COVID-19 vaccination.

Figure 2. Respondents’ willingness to have their children receive a COVID-19 vaccine and timing relative to pediatric vaccine authorization. 46.8% of children ages 12–17 were vaccinated, 9.9% of children ages 5–11 were vaccinated, and 0.2% of children ages 0–4 were vaccinated (as part of a trial).

Figure 3. Predictors of respondents’ willingness to have their children receive a COVID-19 vaccine. Forest plot for odds ratio of having a child vaccinated against COVID-19 with 95% confidence intervals based on weighted multivariable logistic regression. Figure includes effects that were statistically significant (P < .05) for at least one age group.
Having children of another age group in the household was a negative predictor for children ages 12–17.

Factors That May Influence Willingness to Vaccinate

Overall, respondents most frequently reported that pediatric vaccines receiving full FDA approval (rather than Emergency Use Authorization) would make them more likely to vaccinate their children (Table 2 and Supplemental Table 6). The second most frequently reported factor that would increase the likelihood of vaccination for children was school vaccine requirements for respondents very/somewhat unlikely to vaccinate their children across all age groups. For respondents somewhat likely to vaccinate their children, the second most frequently reported factor that would increase the likelihood of vaccination differed by age group: for ages 0–4, it was a recommendation from their child’s healthcare provider; for ages 5–11, it was knowing a lot of other children who received a COVID-19 vaccine; and for ages 12–17, it was school requirements. If COVID-19 vaccines were expected to cause more severe side effects than routine vaccines, 53.0% of all respondents indicated they would be less likely to vaccinate their children, including 32.2%, 31.7%, and 51.7% of respondents who initially reported they were very likely to have children ages 0–4, 5–11, and 12–17, respectively, receive a COVID-19 vaccine.

DISCUSSION

In this nationally representative sample of US parents, more than half were likely to accept COVID-19 vaccination for their children. Roughly 40% of parents with children 0–11 years old wanted to “wait and see” before vaccination, and another 36% would not let their children get a COVID-19 vaccine in this survey conducted when COVID-19 vaccination for 5–11-year-olds was first recommended and no vaccine was available for younger children. Belief in COVID-19 vaccination benefits and acceptance of routine childhood vaccines were the strongest positive predictors of intention to have children vaccinated across all age groups. The strongest negative predictor was attitudinal barriers to COVID-19 vaccination. Among all respondents, the most frequently cited factor that would increase their likelihood of having children vaccinated was full FDA approval; all groups also responded they would be less likely to vaccinate their children if side effects were worse than those experienced with routine vaccines.

Our finding of >50% parental acceptance of COVID-19 vaccination for children is higher than early studies of US parental acceptance of COVID-19 vaccines for children but consistent with more recent surveys [18–26]. Our rates of parents reporting they themselves and their teenage children had been vaccinated were consistent with CDC’s vaccination statistics at the time the survey was conducted, and subsequent data have shown uptake among children 5–11 consistent with our projected timeframes for adoption [27–29]. Parents were 2–6 times more likely to report acceptance of child COVID-19 vaccination if they had received a COVID-19 vaccine themselves; however, this effect was not statistically significant for parents of children 0–4 years old, which may reflect uncertainty about the vaccine not yet having been authorized for that age group. Increasing overall COVID-19 vaccine confidence in US adults will play an important role in achieving high COVID-19 vaccine uptake in children.

Parents may balance perceived risks of COVID-19 against perceived risks of vaccination. Although fewer children experience severe disease than adults, “long COVID” and MIS-C are important sources of morbidity in children, and parental perception that pediatric COVID-19 disease is severe was a significant positive predictor of vaccination intention for children 0–4 and 5–11 [28, 30]. Even among respondents very likely to vaccinate children ages 0–4 and 5–11 against COVID-19, nearly one-third indicated that if side effects were more severe than those experienced with routine vaccines, they would be less likely to vaccinate their children, and baseline acceptance of other routine childhood immunizations was a significant positive predictor of parental COVID-19 vaccine acceptance across all age groups. Clear messaging from public health entities and healthcare providers about the magnitude and severity of the risks associated with COVID-19 vaccination relative to other childhood vaccines and SARS-CoV-2-related diseases is needed to help parents make informed decisions about COVID-19 vaccines for their children.

Vaccination against influenza the season before the COVID-19 pandemic was significantly associated with parental willingness to vaccinate teenage children against COVID-19. In recent years, pediatric influenza vaccine uptake has been lower than routine childhood vaccine uptake [31–34]. Because we do not know what the periodicity of COVID-19 vaccination will be, it will be important for public health messaging to address factors that influence reluctance around seasonal vaccines.

Earlier studies showed lower COVID-19 vaccine confidence among Hispanic populations, but in our study, Hispanic parents reported higher COVID-19 vaccine acceptance for their children than non-Hispanic parents [24, 35]. Our finding is consistent with more recent studies of COVID-19 vaccine acceptance and uptake among Hispanic populations [26, 27, 29]. These changes in attitudes may be due to targeted community outreach over the course of the pandemic and the cumulative burden of disease suffered by the Hispanic community [1, 35].

Given our finding that many parents want to “wait and see” before getting their children a COVID-19 vaccine, we expect slow pediatric COVID-19 vaccine uptake with a potential surge in vaccination once full FDA approval of pediatric vaccines is granted, although a similar effect has not been
Table 2. Factors Parents Report Would Make Them More or Less Likely to Have Children Receive a COVID-19 Vaccine Among Parents Somewhat Unlikely to Accept COVID-19 Vaccination for Their Children

| Factor | Change in Intent, Weighted n (%), SE |
|--------|----------------------------------|
|        | Much More Likely | Somewhat More Likely | No More or Less Likely | Somewhat Less Likely | Much Less Likely |
| **Ages 0–4** | | | | | |
| Vaccine received full FDA approval | 17.4 (13.2, 3.9) | 48.0 (36.4, 5.4) | 55.9 (42.3, 5.9) | 9.4 (7.2, 2.9) | 1.3 (1.0, 0.7) |
| Required to return to school or daycare | 76 (5.8, 2.4) | 472 (35.7, 5.3) | 570 (43.2, 5.9) | 13.5 (10.3, 3.6) | 6.7 (5.0, 1.9) |
| A lot of children I know have gotten it | 10.2 (7.7, 2.8) | 412 (312, 5.1) | 68.7 (52.1, 5.8) | 75 (5.7, 2.6) | 4.4 (3.3, 1.5) |
| Causes the same or fewer short-term side effects\(a\) | 6.0 (4.6, 2.0) | 40.8 (31.0, 5.4) | 68.8 (52.4, 5.8) | 10.3 (7.8, 2.9) | 5.6 (4.2, 2.3) |
| Children(ren)’s healthcare provider recommends it | 4.5 (3.4, 2.0) | 39.4 (29.8, 5.2) | 81.1 (61.4, 5.6) | 5.7 (4.3, 2.3) | 1.3 (1.0, 0.7) |
| Required to travel | 2.4 (1.9, 1.4) | 39.5 (30.6, 5.3) | 69.1 (53.6, 5.8) | 12.2 (9.5, 3.2) | 5.8 (4.5, 1.6) |
| A lot of people of all ages I know have gotten it | 6.5 (4.9, 2.4) | 33.7 (25.6, 4.9) | 68.7 (52.5, 5.8) | 16.4 (12.4, 4.2) | 6.0 (4.6, 2.5) |
| Given at same time as a routine vaccine | 0.0 (0.0, 0.0) | 25.0 (18.9, 4.4) | 95.1 (72.0, 5.0) | 7.5 (5.9, 2.7) | 4.2 (3.2, 1.4) |
| Different type of vaccine becomes available for children | 3.2 (2.5, 1.6) | 14.8 (11.5, 3.7) | 97.2 (75.4, 4.9) | 7.0 (5.5, 2.4) | 6.7 (5.2, 2.3) |
| Free childcare assistance | 2.3 (1.8, 1.1) | 9.8 (7.6, 3.1) | 101.5 (79.5, 4.6) | 9.2 (7.2, 3.1) | 4.9 (3.9, 1.9) |
| Encouraged by local religious/community leaders | 1.5 (1.1, 0.8) | 7.4 (5.8, 2.2) | 86.0 (66.7, 5.4) | 175 (13.6, 3.8) | 16.5 (12.8, 4.1) |
| Paid time off work | 0.0 (0.0, 0.0) | 7.7 (5.9, 2.4) | 106.4 (82.6, 4.0) | 7.3 (5.6, 2.4) | 7.5 (5.8, 2.5) |
| Free transportation | 1.1 (0.9, 0.9) | 4.5 (3.5, 1.8) | 97.9 (76.0, 5.0) | 15.2 (11.8, 4.2) | 10.2 (7.9, 2.9) |
| Causes more severe side effects\(b\) | 6.5 (4.4, 2.0) | 42.7 (32.4, 5.5) | 41.5 (31.5, 5.4) | 45.6 (34.5, 5.6) | | |
| **Ages 5–11** | | | | | |
| Vaccine received full FDA approval | 24.2 (11.9, 2.4) | 72.6 (35.7, 4.0) | 87.0 (42.8, 4.3) | 12.3 (6.1, 2.4) | 7.2 (3.6, 1.4) |
| Required to return to school or daycare | 21.9 (10.2, 2.4) | 65.8 (32.1, 3.9) | 86.5 (42.2, 4.3) | 13.8 (6.7, 2.5) | 17.1 (8.4, 2.0) |
| A lot of children I know have gotten it | 13.5 (6.6, 1.8) | 70.1 (34.4, 3.9) | 101.7 (49.9, 4.3) | 8.4 (4.1, 1.6) | 10.0 (4.9, 2.1) |
| Children(ren)’s healthcare provider recommends it | 11.2 (5.5, 1.7) | 66.2 (32.3, 3.9) | 106.0 (51.7, 4.3) | 14.5 (7.1, 2.5) | 7.1 (3.5, 1.5) |
| A lot of people of all ages I know have gotten it | 78 (3.8, 1.5) | 570 (28.0, 3.6) | 119.9 (68.9, 4.1) | 12.7 (6.2, 2.4) | 6.3 (3.1, 1.4) |
| Required to travel | 11.4 (5.6, 1.6) | 50.2 (24.6, 3.6) | 111.0 (54.3, 4.2) | 16.6 (8.1, 2.7) | 15.3 (7.5, 2.0) |
| Causes the same or fewer short-term side effects\(b\) | 6.3 (3.1, 1.2) | 49.3 (24.5, 3.5) | 120.3 (69.8, 4.2) | 178 (8.9, 2.6) | 76 (3.8, 1.5) |
| Different type of vaccine becomes available for children | 2.7 (1.3, 0.6) | 30.5 (15.0, 3.4) | 143.7 (70.9, 4.0) | 11.4 (5.6, 1.8) | 14.5 (7.1, 2.4) |
| Given at same time as a routine vaccine | 2.1 (1.0, 0.5) | 23.3 (11.5, 2.4) | 144.9 (71.6, 3.8) | 12.4 (6.1, 2.3) | 19.8 (9.8, 2.6) |
| Paid time off work | 4.8 (2.3, 1.2) | 19.0 (9.2, 2.7) | 154.7 (74.7, 3.9) | 16.4 (7.9, 2.7) | 12.3 (5.9, 1.7) |
| Free childcare assistance | 6.4 (3.1, 1.3) | 14.7 (7.2, 2.6) | 159.7 (78.4, 3.4) | 73 (3.6, 1.3) | 15.6 (7.6, 2.0) |
| Free transportation | 3.2 (1.6, 0.9) | 5.9 (2.9, 1.3) | 156.7 (76.0, 3.6) | 22.6 (11.0, 3.0) | 17.7 (8.6, 2.0) |
| Encouraged by local religious/community leaders | 0.9 (0.4, 0.4) | 4.2 (2.1, 0.9) | 152.8 (75.0, 3.6) | 20.8 (10.2, 2.4) | 25.1 (12.3, 2.8) |
| Causes more severe side effects\(b\) | 2.6 (1.3, 0.8) | 2.2 (1.1, 0.8) | 68.3 (33.9, 4.1) | 56.1 (27.8, 3.8) | 72.6 (36.0, 4.1) |
| **Ages 12–17** | | | | | |
| Vaccine received full FDA approval | 6.1 (5.3, 2.1) | 31.0 (26.8, 4.7) | 59.5 (51.5, 5.3) | 11.4 (9.9, 3.1) | 76 (6.6, 2.8) |
| Required to return to school or daycare | 8.8 (7.5, 2.6) | 25.8 (22.1, 4.4) | 64.5 (55.2, 5.2) | 4.7 (4.1, 1.7) | 13.0 (11.2, 3.3) |
| Causes the same or fewer short-term side effects\(b\) | 3.6 (3.1, 1.9) | 26.2 (22.6, 4.5) | 71.5 (61.6, 5.2) | 75 (6.5, 2.6) | 72 (6.2, 2.4) |
observed in adults [36]. School vaccination requirements may encourage vaccine uptake for some children, including among those whose parents were very unlikely to accept COVID-19 vaccination; however, school requirements are just one approach along a continuum of policy options [37–41]. We expect parents who were very unlikely to accept COVID-19 vaccination for their children at baseline will be less likely to change their decisions relative to parents who were somewhat unlikely at baseline, but a combination of strategies that incorporate structural interventions like vaccine requirements with interventions centered on interpersonal communication with healthcare providers and peers may encourage some parents to accept vaccination.

This study represents parental attitudes when COVID-19 vaccines for US children ages 5–11 were first authorized and no vaccines were available for children <5 years, and attitudes may have changed since we conducted our survey. COVID-19 vaccine authorization for children 5–11 years occurred during our survey administration period, meaning some respondents completed the survey before and some after this announcement. The rapid release of information and speed of changes in public opinion pose challenges not only for survey design and data interpretation for the 5–11-year age group but also for keeping public health messaging current and relevant. Our findings are not generalizable outside of the US or for non-English- or Spanish-speaking US populations. The attitudes, beliefs, and intentions measured in this study represent factors that influence planned behaviors but may not represent what parents ultimately decide when a COVID-19 vaccine becomes available to their children.

**CONCLUSION**

In this nationally representative survey of US parents of children <18 years conducted very early in the availability of COVID-19 vaccines for children ages 5–11, most parents reported intention to vaccinate their children. Belief in the benefits of COVID-19 vaccination and acceptance of routine childhood vaccines were the most important predictors of COVID-19 vaccine acceptance for their children. Efforts to ensure pediatric COVID-19 vaccine uptake should include messaging to increase overall confidence in COVID-19 vaccines among US adults. Further work is needed to track changes in attitudes and intentions as more data become available about COVID-19 vaccines in children and adolescents and to study whether intention to vaccinate translates into vaccination.

**Supplementary Data**

Supplementary materials are available at the *Journal of The Pediatric Infectious Diseases Society* online (http://jpids.oxfordjournals.org).

**Notes**

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