



Parents' Intentions to Vaccinate Children for COVID-19 by Child Age: Sociodemographic Factors and Reasons for Hesitancy

Key Points

- According to the CDC COVID Data Tracker, as of January 30, 2022, 21.4 percent of children aged 5-11 and 55.9 percent of children aged 12-17 are fully vaccinated against COVID-19.
- A larger percent of parents with children aged 5-11 are hesitant to vaccinate their children (34 percent) than parents of children aged 12-17 (21 percent).
- Vaccinated parents tend to be less hesitant to vaccinate their children than unvaccinated parents, although hesitancy still varies by child age: among vaccinated parents, 21 percent were hesitant to vaccinate children aged 5-11, compared with 8 percent for children aged 12-17.
- Hesitancy to vaccinate children varied by demographic characteristics and was highest among non-Hispanic White respondents and those without a college education.
- The main reasons for hesitancy to vaccinate children were concerns about side effects, plans to wait and see, and distrust in vaccines or the government.

Introduction

As of January 27, 2022, three vaccines to prevent COVID-19 are available in the United States. The Pfizer-BioNTech vaccine is currently the only vaccine available to individuals under the age of 18. The initial emergency use authorization for the Pfizer-BioNTech vaccine, issued in December 2020, included individuals 16 years and older.¹ Subsequently, the Pfizer-BioNTech vaccine was authorized for emergency use in individuals aged 12-15 in May 2021,² and for individuals aged 5-11 in October 2021.³ The other two vaccines available in the United States, Moderna and Janssen/Johnson & Johnson, are only authorized for use in individuals 18 years and older.^{4,5}

¹ On August 23, 2021, the Pfizer-BioNTech vaccine was granted full approval for use in individuals over the age of 16 by the FDA. For more information, see: <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/comirnaty-and-pfizer-biontech-covid-19-vaccine>, last accessed December 30, 2021.

² US Food and Drug Administration. Coronavirus (COVID-19) Update: FDA Authorizes Pfizer-BioNTech COVID-19 Vaccine for Emergency Use in Adolescents in Another Important Action in Fight Against Pandemic. Available at: <https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use>, last accessed January 3, 2022.

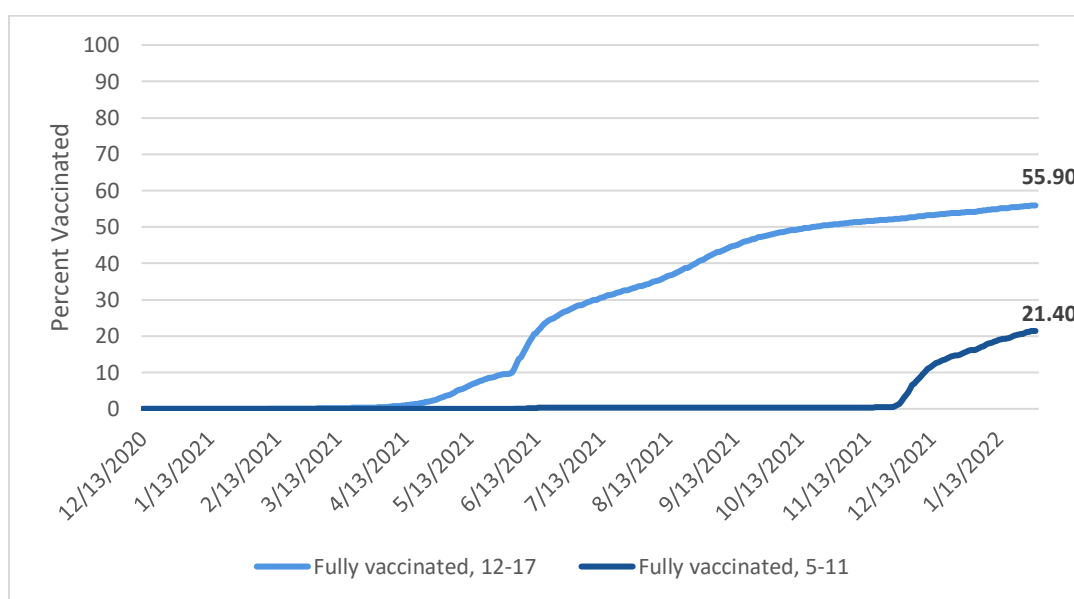
³ US Food and Drug Administration. FDA Authorizes Pfizer-BioNTech COVID-19 Vaccine for Emergency Use in Children 5 through 11 Years of Age. Available at: <https://www.fda.gov/news-events/press-announcements/fda-authorizes-pfizer-biontech-covid-19-vaccine-emergency-use-children-5-through-11-years-age>, last accessed January 3, 2022.

⁴ US Food and Drug Administration. Moderna COVID-19 Vaccine. Available at: <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/moderna-covid-19-vaccine>, last accessed January 3, 2022.

⁵ US Food and Drug Administration. Janssen COVID-19 Vaccine. Available at: <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/janssen-covid-19-vaccine>, last accessed January 3, 2022.

As of January 30, 2022, 55.9 percent of children aged 12-17 and 21.40 percent of children aged 5-11 are fully vaccinated against COVID-19 (Figure 1). While children are less likely to develop severe COVID-19 than adults, children who become infected may still experience post-COVID conditions (also called long COVID-19)⁶ and multisystem inflammatory syndrome in children (MIS-C), an inflammatory condition that can result in hospitalization or death.⁷ However, vaccination against COVID-19 can reduce these risks: a recent study among hospitalized children aged 12-18 years showed that two doses of the Pfizer-BioNTech vaccine was highly effective in preventing MIS-C, and all MIS-C cases in the study requiring life support were among unvaccinated children.⁸ The spread of the Delta and Omicron variants have also contributed to record-level case and hospitalization rates in children.^{9,10} Furthermore, children who become infected contribute to the transmission of SARS-CoV-2, the virus that causes COVID-19, and may infect vulnerable individuals in their household or community, including children under the age of 5 who are not yet eligible to be vaccinated.¹¹

Figure 1. Percent of Children who are Fully Vaccinated for COVID-19, by Age Group



Source: CDC COVID Data Tracker, January 30, 2022

In addition to these health risks, the COVID-19 pandemic has had a significant impact on parents and families.

⁶ These conditions can collectively be referred to as Post-Acute Sequelae of SARS-CoV-2 (PASC).

⁷ Centers for Disease Control and Prevention. COVID-19 Vaccines for Children and Teens. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/recommendations/children-teens.html>, last accessed January 3, 2022.

⁸ Zambrano LD, Newhams MM, Olson SM, et al. Effectiveness of BNT162b2 (Pfizer-BioNTech) mRNA Vaccination Against Multisystem Inflammatory Syndrome in Children Among Persons Aged 12–18 Years — United States, July–December 2021. *MMWR Morb Mortal Wkly Rep.* ePub: 7 January 2022. doi: 10.15585/mmwr.mm7102e1

⁹ Centers for Disease Control and Prevention. COVID Data Tracker: COVID-19 Weekly Cases and Deaths per 100,000 Population by Age, Race/Ethnicity, and Sex. Available at: <https://covid.cdc.gov/covid-data-tracker/#demographicsovertime>, last accessed January 3, 2022.

¹⁰ Centers for Disease Control and Prevention. COVID Data Tracker: New Admissions of Patients with Confirmed COVID-19 per 100,000 Population by Age Group, United States. Available at: <https://covid.cdc.gov/covid-data-tracker/#new-hospital-admissions>, last accessed January 3, 2022.

¹¹ Centers for Disease Control and Prevention. 10 Things to Know About the COVID-19 Vaccine for Children. Available at: <https://www.cdc.gov/vaccines/covid-19/planning/children/10-things-to-know.html>, last accessed January 19, 2022.

For example, the unique challenges of the COVID-19 pandemic have led to children falling behind in school and parents struggling to balance childcare and work. In a recent survey by the Kaiser Family Foundation (KFF),¹² 73 percent of parents said that the pandemic has negatively impacted their child's education. The same study also showed parents themselves have experienced adverse impacts: 58 percent said that the pandemic has had a negative effect on their own mental health, and 50 percent said that it has impacted their ability to pay for basic necessities. Furthermore, not all children and parents have been impacted equally: the COVID-19 pandemic has exacerbated existing inequities and contributed to disparities in academic achievement, physical health, and mental health by race, ethnicity, and other factors.^{13,14} The availability of COVID-19 vaccines for children aged 5 and over represents a critical opportunity to mitigate health risks and other COVID-19-related consequences.

Although routine childhood vaccinations have significantly reduced the incidence of diseases such as measles, rubella, mumps, and pertussis, hesitancy to vaccinate children has led to outbreaks of diseases that were once considered extremely rare in the United States.¹⁵ While some children are not able to be vaccinated for medical reasons, the majority of decisions to forego vaccination in children are driven by the parents' or guardians' vaccine hesitancy.¹⁶ Studies have shown that the factors that influence a parent's decision to vaccinate their children involve vaccine- or disease-specific factors (e.g., perceived vaccine efficacy, perceived vaccine safety, perceived disease susceptibility, etc.), parent-specific factors (e.g., race/ethnicity, education, income, knowledge about vaccines, past experiences, trust in government, beliefs that the risks outweigh the benefits, etc.), or other factors (e.g., patient-provider relationship, school immunization requirements, collective values or social norms, policies, media, etc.).^{17,18,19,20} In the case of COVID-19 vaccines, several studies have shown that vaccinated parents are more likely to have vaccinated or indicate willingness to vaccinate children.^{21,22} Therefore, understanding and addressing parents' concerns about the COVID-19 vaccine is essential for increasing COVID-19 vaccination rates among children.

¹² Hamel, L., Lopes, L., Kearney, A., Stokes, M., Kirzinger, A., Sparks, G., and Brodie, M. (2021). KFF COVID-19 Vaccine Monitor: Winter 2021 Update on Parents' View of Vaccines for Kids. Available at: <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-winter-2021-update-on-parents-views-of-vaccines/>, last accessed December 30, 2021.

¹³ US Department of Education. Education in a Pandemic: The Disparate Impact of COVID-19 on America's Students. Available at: <https://www2.ed.gov/about/offices/list/ocr/docs/20210608-impacts-of-covid19.pdf>, last accessed January 12, 2022.

¹⁴ Jones, K. The Initial Impacts of COVID-19 on Children and Youth (Birth to 24 years): Literature Review in Brief. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. August 2021. Available at: <https://aspe.hhs.gov/reports/impact-covid-19-children-youth>, last accessed January 12, 2022.

¹⁵ Gardner, L., Dong E., Khan, K., Sarkar, S. (2020). Persistence of US measles risk due to vaccine hesitancy and outbreaks abroad. *The Lancet Infectious Diseases* 20(10), P114-115. doi:10.1016/S1473-3099(20)30522-3

¹⁶ Damjanović, K., Graeber, J., Ilić, S., Lam, W. Y., Lep, Ž., Morales, S., Pulkkinen, T., & Vingerhoets, L. (2018). Parental Decision-Making on Childhood Vaccination. *Frontiers in Psychology* 9, 735. doi:10.3389/fpsyg.2018.00735

¹⁷ Edwards, K., Hackell, J., The Committee on Infectious Diseases, The Committee on Practice and Ambulatory Medicine. (2016). Countering Vaccine Hesitancy. *Pediatrics* 138(3): e20162146. doi:10.1542/peds.2016-2146.

¹⁸ Gowda, C., Dempsey A. (2013). The Rise (and Fall?) of Parental Vaccine Hesitancy. *Human Vaccines & Immunotherapeutics* 9(8): 1755-1762. doi:10.4161/hv.25085.

¹⁹ Salmon, D., Moulton, L., Omer, S., DeHart, M., Stokley, S., Halsey, N. (2005). Factors Associated With Refusal of Childhood Vaccines Among Parents of School-aged Children: A Case-Control Study. *Arch Pediatr Adolesc Med* 159(5):470-476. doi:10.1001/archpedi.159.5.470.

²⁰ World Health Organization. Report of the SAGE Working Group on Vaccine Hesitancy, October 1, 2014. Available at https://www.who.int/immunization/sage/meetings/2014/october/1_Report_WORKING_GROUP_vaccine_hesitancy_final.pdf ; last accessed December 30, 2021.

²¹ Beleche, T., Kolbe, A., Bush, L., and Sommers, B. Parents' Intentions to Vaccinate Children Ages 12-17 for COVID-19: Demographic Factors, Geographic Patterns, and Reasons for Hesitancy. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. September 2021. Available at: <https://aspe.hhs.gov/reports/hesitancy-vaccinate-children>, last accessed December 30, 2021.

²² Rane, M., Robertson, M., Westmoreland, D., Teasdale, C., Grov, C., Nash, D. (2021). Intention to Vaccinate Children Against COVID-19 Among Vaccinated and Unvaccinated US Parents. *JAMA Pediatr*. doi:10.1001/jamapediatrics.2021.5153

To support communication and outreach efforts to increase vaccination among children, this analysis explores parents' intentions to vaccinate children aged 5-17 against COVID-19 in December 2021, including differences between demographic groups.

Methods

Data

ASPE examined sociodemographic factors and trends in vaccine hesitancy using survey data from the U.S. Census Bureau's Household Pulse Survey (HPS). The HPS is designed to produce statistics at the national and state levels and for the 15 largest Metropolitan Statistical Areas. The HPS includes information on US residents' vaccination for COVID-19, intentions to receive the COVID-19 vaccine, intentions to vaccinate children, reasons for hesitancy to receive a vaccine or to vaccinate children, as well as other sociodemographic information. The question about intention to vaccinate children was first introduced in the survey in July 2021 for parents of children aged 12-17 and was expanded to include parents of children aged 5-11 in December 2021. Currently, the survey does not ask parents of children aged 0-4 about intentions to vaccinate.²³ For this analysis, we use the survey fielded between December 1-13, 2021 ("Week 40").²⁴ This survey was sampled from approximately 1.04 million housing units, with an overall weighted response rate of about 5.8 percent (60,826 respondents).²⁵

Defining Vaccine Hesitancy

Parents and Non-Parents

We used the HPS question, "Once a vaccine to prevent COVID-19 is available to you, would you.....", which provides the following options: 1) definitely get a vaccine; 2) probably get a vaccine; 3) be unsure about getting a vaccine; 4) probably not get a vaccine; 5) definitely not get a vaccine.²⁶ We define hesitancy as those respondents who indicate that they are "unsure" or would "probably not" or "definitely not" get a COVID-19 vaccine. Our sample includes individuals who responded "yes" or "no" to receiving a COVID-19 vaccine,²⁷ which is asked of all respondents aged 18 and over. We exclude respondents for whom there was no response. Those answering "yes" to being vaccinated are therefore treated as not hesitant, as are those who responded "definitely" or "probably" as to their intent to get vaccinated. Throughout this analysis we use the term "parents" to refer to respondents with children aged 5-17, acknowledging that in some cases these respondents may not be the parent or guardian and are responding to the question on their behalf. We also refer to "non-parents" as those adults who responded that there are no children under the age of 18 in the household.

Children

We used the HPS question, "Now that vaccines to prevent COVID-19 are available to most children, will the parents or guardians of children living in your household...", which provides the following options: 1) definitely get the children a vaccine; 2) probably get the children a vaccine; 3) be unsure about getting the children a

²³ As of January 27, 2022, there are no COVID-19 vaccines authorized for use in children under the age of 5.

²⁴ US Census Bureau (2021). Week 40 Household Pulse Survey: December 1-December 13. Available at: <https://www.census.gov/data/tables/2021/demo/hhp/hhp40.html>, last accessed December 30, 2021.

²⁵ US Census Bureau (2021). Source of the Data and Accuracy of the Estimates for the Household Pulse Survey Phase 3.3. Available at https://www2.census.gov/programs-surveys/demo/technical-documentation/hhp/Phase3-3_Source_and_Accuracy_Week40.pdf, last accessed December 30, 2021.

²⁶ Individuals who did not respond were excluded from the analysis.

²⁷ The question is "Have you received a COVID-19 vaccine?".

vaccine; 4) probably not get the children a vaccine; 5) definitely not get the children a vaccine.²⁸ We define hesitancy as those respondents who indicate that the parent or guardian was “unsure” or would “probably not” or “definitely not” get their children a COVID-19 vaccine. Our sample includes individuals who responded “yes”, “no” or “don’t know” to whether children living in the household have received a COVID-19 vaccine.²⁹ As noted in the Data section, this question is only asked of parents with at least one child between ages 5 and 17. We exclude respondents for whom there was no response. Those answering “yes” to having the children vaccinated are therefore treated as not hesitant, as are those who responded “definitely” or “probably” as to their intent to get a vaccine for children. For those who answered “no” or “don’t know” to whether a child in the household received the COVID-19 vaccine or who said they do not intend to get their child all required doses, the surveys also asks, “Which of the following, if any, are reasons that the parents or guardians of children living in your household [only probably will/probably won’t/definitely won’t/are unsure about whether to] get a COVID-19 vaccine for the children?” We use these responses to explore reasons for hesitancy to vaccinate children.

Defining Children Age Groups

In the HPS, respondents may report the presence of children in any of the following age groups: 0-4, 5-11, and 12-17 years old, which helps identify the sample of respondents who may be making decisions for their children’s COVID-19 vaccination.³⁰ Because questions regarding plans to vaccinate children are not linked to the age of the child in question and intentions may vary by child’s age, our analysis focuses on two non-overlapping groups: respondents who report having (1) children aged 5-11 only; or (2) children aged 12-17 only.

Statistical Methods

First, we conducted a descriptive analysis to present overall hesitancy rates and intentions to vaccinate children for select groups. Second, we used a logistic regression to calculate odds ratios of vaccine hesitancy for children in the household using the following sociodemographic and geographic information: age, gender, race/ethnicity, education, marital status, health insurance status, household income, and US Census region of residence among the sample of respondents selected for the analysis (see the Appendix for additional details). We use survey weights in both the descriptive and regression analysis to mitigate non-response bias and Fay’s Method for variance estimation.^{31,32,33}

Results

Figure 2 shows rates of vaccine hesitancy for non-parents, parents, and parents of children in vaccine-eligible age categories.³⁴ Overall, vaccine hesitancy was higher for parents to vaccinate themselves (21 percent) than

²⁸ Individuals who did not respond or answered “I do not know the plans for vaccination of the children aged 12-17 in my household” were excluded from the analysis.

²⁹ The question is “Have any of the children living in your household received at least one dose of a COVID-19 vaccine?”.

³⁰ The question is “In your household, are there...in the household?” to which the respondent may choose all that apply: “children under 5”, “children 5 through 11 years old” or “children 12 through 17 years old”.

³¹ Analysis was performed using Stata (Stata Statistical Software: Release 14. College Station, TX: StataCorp LP).

³² U.S. Census Bureau. Source of the Data and Accuracy of the Estimates for the 2020 Household Pulse Survey.

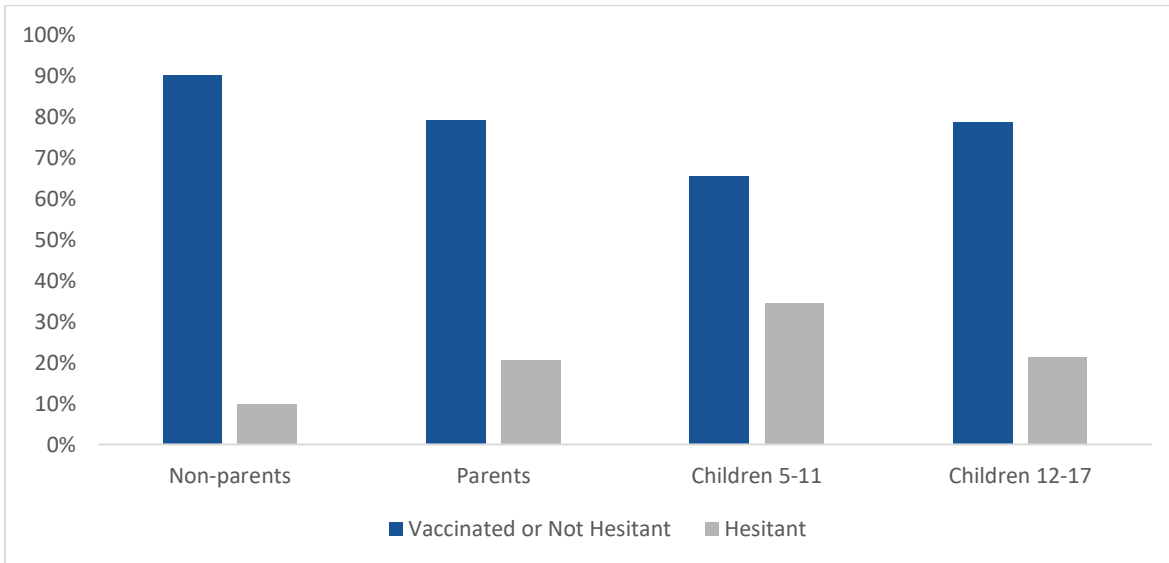
<https://www2.census.gov/programs-surveys/demo/technical-documentation/hhp/Source-and-Accuracy-Statement-May-28-June2.pdf>

³³ Additional details of the survey weights used are provided in Appendix A.

³⁴ Non-parents are those without children under the age of 18 in the household. “Parents” refers to the pool of respondents with children ages 5-11 or 12-17 in their household. The survey asks about parents’ or guardians’ intentions to vaccinate children in the

for non-parents to vaccinate themselves (10 percent). Hesitancy to vaccinate children varied based on the age of the child: parents of younger children (5-11) were more likely to be hesitant than parents of older children (12-17).

Figure 2. Attitudes about COVID-19 Vaccination Among Adults and for Children



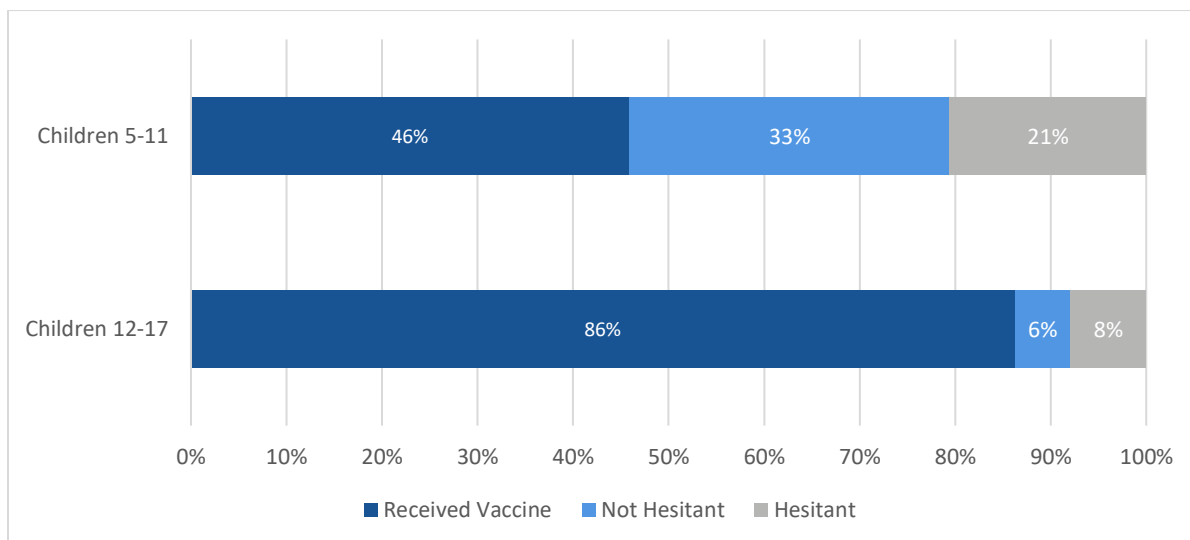
Notes: Bars show attitudes about vaccinations either for adult respondents themselves (non-parents or parents), or for their children. Respondents who report having received a vaccine or that they definitely/probably will get a vaccine are combined for the blue bar. “Children 5-11” refers to intentions to vaccinate children among parents with children aged 5 through 11 only. “Children 12-17” refers to intentions to vaccinate children among parents with children aged 12 through 17 only.

Source: ASPE analysis of Household Pulse Survey December 1-13, 2021.

Figure 3 shows the relationship between parents’ vaccination status and intentions to vaccinate their children in vaccine-eligible age groups. Among parents who are vaccinated themselves, 66 percent have already vaccinated their children; this trend is strongest among parents of children aged 12-17, of which 86 percent have vaccinated their children. Hesitancy to vaccinate children was more than two times higher among vaccinated parents with children aged 5-11 (21 percent) compared to parents with children aged 12-17 (8 percent).

household between the ages of 5 and 17. We refer to these respondents as parents and guardians but in some cases, the adult being surveyed may not be the parent or guardian, and is responding to the question on their behalf.

Figure 3. Intentions to Vaccinate Children for COVID-19 Among Vaccinated Parents



Note: “Children 5-11” refers to intentions to vaccinate children among parents with children aged 5 through 11 only. “Children 12-17” refers to intentions to vaccinate children among parents with children aged 12 through 17 only.

Source: ASPE analysis of Household Pulse Survey December 1-13, 2021.

Table 1 breaks down proportions of vaccine hesitancy among non-parents and parents (for themselves and for their children) by select demographic characteristics. Although hesitancy to vaccinate was higher for children aged 5-11 compared to children aged 12-17 across all demographic groups, similar patterns were observed between the two age groups. Non-Hispanic White and non-Hispanic Black respondents had the highest proportions of vaccine hesitancy for children in these two age groups. Hesitancy to vaccinate children was also high among low-income respondents and those without a college education. In addition to demographic variation, respondents in the South and Midwest tended to be more hesitant to vaccinate children.

Table 1. Parents’ Hesitancy to Vaccinate Themselves and Children for COVID-19 by Select Sociodemographic and Geographic Characteristics

Sociodemographic Characteristic	Non-Parents	Parents	Children 5-11	Children 12-17
Overall	10%	21%	34%	21%
Gender				
Male	11%	21%	34%	19%
Female	9%	21%	35%	24%
Age Group				
18-29	15%	28%	35%	19%
30-39	14%	23%	41%	37%
40-49	15%	19%	30%	24%
50+	7%	16%	32%	16%
Race/Ethnicity				
White (non-Hispanic)	10%	24%	40%	27%

Table 1. Parents' Hesitancy to Vaccinate Themselves and Children for COVID-19 by Select Sociodemographic and Geographic Characteristics

Sociodemographic Characteristic	Non-Parents	Parents	Children 5-11	Children 12-17
Black (non-Hispanic)	8%	23%	39%	18%
Asian (non-Hispanic)	2%	3%	10%	3%
Other/Multiple Race (non-Hispanic)	16%	32%	38%	27%
Hispanic	11%	15%	28%	12%
Education				
No College Degree	12%	25%	41%	25%
College Degree or Higher	5%	9%	20%	13%
Income				
Less than \$25,000	13%	28%	44%	25%
\$25,000 - \$74,999	10%	21%	34%	22%
\$75,000 - \$99,999	8%	16%	28%	16%
\$100,000 - \$149,999	6%	15%	31%	19%
\$150,000 - \$199,999	6%	10%	27%	21%
\$200,000 and above	4%	8%	19%	12%
Missing Income	13%	26%	40%	24%
Marital Status				
Married	8%	17%	31%	20%
Widowed, Divorced/Separated	10%	24%	38%	24%
Never Married	12%	29%	41%	22%
Health Insurance				
Have Insurance	8%	17%	31%	19%
No Insurance	24%	28%	39%	25%
Missing Health Insurance	15%	30%	43%	28%
Region				
Northeast	6%	16%	25%	15%
South	12%	24%	39%	26%
Midwest	10%	25%	41%	24%
West	9%	14%	27%	15%

Note: Hesitancy is defined to include those who responded, “probably not”, “definitely not”, or “unsure” about getting a COVID-19 vaccine for children or themselves. Sample excludes respondents with missing values or those responding, “I do not know the plans to vaccinate children in the household.” “Children 5-11” refers to hesitancy to vaccinate children among parents with children aged 5 through 11 only. “Children 12-17” refers to hesitancy to vaccinate children among parents with children aged 12 through 17 only.

Source: ASPE analysis of the Household Pulse Survey, December 1-13, 2021.

A logistic regression model was used to calculate the odds of parents' hesitancy to vaccinate children in their household by certain sociodemographic characteristics. Table 2 shows the odds ratios from this model. Across all age groups, college-educated respondents were significantly less likely to be hesitant to vaccinate their children than non-college-educated respondents (p-value <0.001). Among parents with children aged 12-17,

Black, Hispanic, and Asian respondents were significantly less likely to be hesitant than White respondents. Among respondents with children aged 5-11 only, Hispanic parents were still less likely to be hesitant, but Black and Asian parents were not significantly less likely to be hesitant compared to White parents. Marital status and household income did not have a statistically significant relationship to hesitancy to vaccinate children in the household. Parents of children aged 5-11 living in the South or Midwest, and parents of children aged 12-17 living in the South were significantly more likely to be hesitant than parents living in the Northeast.

Table 2. Odds Ratios: Factors Associated with Parents' Hesitancy to Vaccinate Children for COVID-19

Sociodemographic Characteristic		Children 5-11	Children 12-17
Age	18-29	Ref	Ref
	30-39	0.87	2.51*
	40-49	0.8	1.37
	50+	0.56	0.88
Gender	Male	1.03	0.74*
	Female	Ref	Ref
Race/Ethnicity	White (non-Hispanic)	Ref	Ref
	Black (non-Hispanic)	0.71	0.39***
	Hispanic	0.41**	0.26***
	Asian (non-Hispanic)	0.22	0.11***
	Other/Multiple race (non-Hispanic)	0.72	0.95
Education	No College Degree	Ref	Ref
	College or Higher	0.40***	0.48***
Marital status	Married	Ref	Ref
	Widowed/ Divorced/Separated	1.19	1.03
	Never Married	0.99	0.93
Health Insurance	Have Insurance	Ref	Ref
	No Insurance	1.03	1.63
	Missing Health Insurance	1.63	2.02*
Income	Less than \$25,000	1.28	1.13
	\$25,000-\$74,999	Ref	Ref
	\$75,000-\$99,999	0.81	0.63
	\$100,000-\$149,999	0.94	0.85
	\$150,000-\$199,999	0.93	1.17
	More than \$200,000	0.86	0.73
	Did not report	1.03	0.78
Region	Northeast	Ref	Ref
	South	1.68*	1.83**

Table 2. Odds Ratios: Factors Associated with Parents' Hesitancy to Vaccinate Children for COVID-19

Sociodemographic Characteristic		Children 5-11	Children 12-17
	Midwest	1.66*	1.52
	West	1.2	1.05

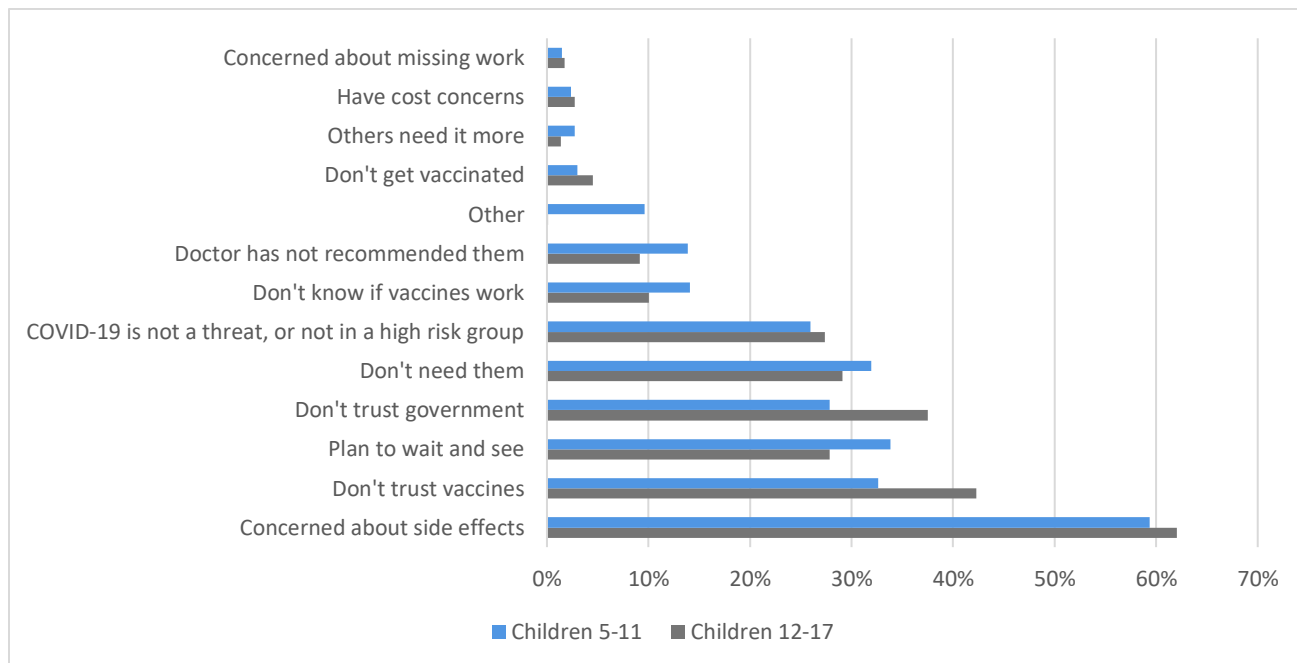
*Note: Hesitancy is defined to include those who responded, “probably not”, “definitely not”, or “unsure” about getting a COVID-19 vaccine for children. Sample excludes respondents with missing values or those responding, “I do not know the plans to vaccinate children in the household.” “Children 5-11” refers to hesitancy to vaccinate children among parents with children aged 5 through 11 only. “Children 12-17” refers to hesitancy to vaccinate children among parents with children aged 12 through 17 only. *** p-value < 0.001; ** p-value < 0.01; * p-value < 0.05.*

Source: ASPE analysis of the Household Pulse Survey, December 1-13, 2021.

Figure 4 shows the reasons given for hesitancy to vaccinate children for COVID-19 in each age group.³⁵ The most commonly cited reason for hesitancy across all age groups was concern about side effects. Lack of trust in vaccines or the government were also commonly cited for hesitancy to vaccinate across all age groups; planning to wait and see, uncertainty about the efficacy of vaccines or the risk posed by COVID-19 also represented major reasons for vaccine hesitancy. Parents who were hesitant to vaccinate their children aged 12-17 were more likely to cite lack of trust in the government or in vaccines compared to parents with children aged 5-11; in contrast, parents with children aged 5-11 were more likely to say that they planned to wait and see. Reasons provided by adults when asked about their reasons for not vaccinating themselves are provided in Appendix Figure 1.

³⁵ This analysis captures the weighted means for each of the reasons and selected group; it does not adjust for demographic characteristics.

Figure 4. Reasons for Parents' Hesitancy to Vaccinate Children for COVID-19 by Age Group



Note: "Children 5-11" refers to hesitancy to vaccinate children among parents with children aged 5 through 11 only. "Children 12-17" refers to hesitancy to vaccinate children among parents with children aged 12 through 17 only. Source: ASPE analysis of Household Pulse Survey December 1-13, 2021.

Discussion

Vaccination rates for COVID-19 among children are the lowest of any age group in the United States. As of January 27, 2022, 55.6 percent of children aged 12-17 and 20.7 percent of children aged 5-11 are fully vaccinated against COVID-19. Although children are at lower risk of severe COVID-19 than older adults, hospitalizations among children have reached record levels during the recent surge caused by the Omicron variant. Therefore, increasing acceptance of vaccines among parents is a critical strategy to mitigate risk to children as well as reduce transmission of SARS-CoV-2. This analysis estimated that 34 percent and 21 percent of parents are hesitant to vaccinate children aged 5-11 and 12-17, respectively, compared with 21 percent of parents who are hesitant to get a COVID-19 vaccine for themselves. Our study represents one of the first analyses of parental hesitancy to vaccinate young children since the Pfizer-BioNTech vaccine was authorized for use in children aged 5-11 in October 2021, and to our knowledge, is the first study to quantify the likelihood of parental vaccine hesitancy by a range of demographic factors.

Similar results have been observed in other studies. A KFF study in December 2021 found that enthusiasm to vaccinate children against COVID-19 was somewhat lower among parents of children aged 5-11 compared with parents of children aged 12-17.³⁶ Similarly, CDC data collected between November 28 and December 31, 2021

³⁶ Hamel, L., Lopes, L., Kearney, A., Stokes, M., Kirzinger, A., Sparks, G., and Brodie, M. (2021). KFF COVID-19 Vaccine Monitor: Winter 2021 Update on Parents' View of Vaccines for Kids. Available at: <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-winter-2021-update-on-parents-views-of-vaccines/>, last accessed December 30, 2021.

found higher rates of vaccine hesitancy for children aged 5-11 compared with children aged 12-17.³⁷ These results were similar to studies conducted prior to the authorization of COVID-19 vaccines for younger children. For example, a survey administered in February and March 2021 found that stated likelihood of child vaccination was greater among parents of older children.³⁸ Similarly, a June 2021 study found that parental hesitancy decreased with the child's age, with hesitancy being highest among parents of children aged 2-4 years.³⁹ Additionally, we found that parents' intentions to vaccinate themselves tend to mirror their intentions to vaccinate their children. This result has been observed in several other studies^{40,41,42} and highlights the importance of addressing adult vaccine hesitancy as part of efforts to increase vaccination rates in children. Consistent with the results of this study, other studies have found safety and efficacy concerns as the most common reasons for hesitancy to vaccinate children.^{43,44,45,46}

Our analysis also shows that hesitancy to vaccinate children varies by demographic characteristics, particularly race/ethnicity and education, and that factors associated with hesitancy may vary by child age. Previous work has found similar results. An ASPE study on vaccine hesitancy for children aged 12-17, using HPS data from August 2021, found the highest rates of hesitancy among non-Hispanic White and non-Hispanic Other/Multiple race parents, as well as those without a college education. CDC data collected between November 28 and December 31, 2021 also show differences in vaccine hesitancy by race/ethnicity and education, among other demographic characteristics.⁴⁷ Studies conducted earlier in the COVID-19 pandemic tended to find higher rates of vaccine hesitancy among non-Hispanic Black parents relative to non-Hispanic White parents^{48,49}; however, these gaps have narrowed, likely due to decreased vaccine hesitancy among non-Hispanic Black

³⁷ Centers for Disease Control and Prevention. COVID-19 Vaccination Coverage and Vaccine Confidence among Children: COVIDVaxView. Available at: <https://www.cdc.gov/vaccines/imz-managers/coverage/covidvaxview/interactive/children.html>, last accessed January 28, 2022.

³⁸ Szilagyi, P., Shah, M., Delgado, J., Thomas, K., Vizueta, N., Cui, Y., Vangala, S., Shetgiri, R., Kapteyn, A. (2021). Parents' Intentions and Perceptions About COVID-19 Vaccination for their Children: Results from a National Survey. *Pediatrics* 148(4). doi:10.1542/peds.2021-052335

³⁹ Rane, M., Robertson, M., Westmoreland, D., Teasdale, C., Grov, C., Nash, D. (2021). Intention to Vaccinate Children Against COVID-19 Among Vaccinated and Unvaccinated US Parents. *JAMA Pediatr.* doi:10.1001/jamapediatrics.2021.5153

⁴⁰ Beleche, T., Kolbe, A., Bush, L., and Sommers, B. Parents' Intentions to Vaccinate Children Ages 12-17 for COVID-19: Demographic Factors, Geographic Patterns, and Reasons for Hesitancy. Washington, DC: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services. September 2021. Available at: <https://aspe.hhs.gov/reports/hesitancy-vaccinate-children>, last accessed December 30, 2021.

⁴¹ Rane, M., Robertson, M., Westmoreland, D., Teasdale, C., Grov, C., Nash, D. (2021). Intention to Vaccinate Children Against COVID-19 Among Vaccinated and Unvaccinated US Parents. *JAMA Pediatr.* doi:10.1001/jamapediatrics.2021.5153

⁴² Teasdale, C. A., Borrell, L. N., Shen, Y., Kimball, S., Rinke, M. L., Fleary, S. A., & Nash, D. (2021). Parental plans to vaccinate children for COVID-19 in New York city. *Vaccine*, 39(36), 5082–5086. doi:10.1016/j.vaccine.2021.07.058

⁴³ Ruggiero, K. M., Wong, J., Sweeney, C. F., Avola, A., Auger, A., Macaluso, M., & Reidy, P. (2021). Parents' Intentions to Vaccinate Their Children Against COVID-19. *Journal of pediatric health care: official publication of National Association of Pediatric Nurse Associates & Practitioners* 35(5), 509–517. <https://doi.org/10.1016/j.pedhc.2021.04.005>

⁴⁴ Teasdale, C. A., Borrell, L. N., Kimball, S., Rinke, M. L., Rane, M., Fleary, S. A., & Nash, D. (2021). Plans to Vaccinate Children for Coronavirus Disease 2019: A Survey of United States Parents. *The Journal of pediatrics* 237, 292–297. doi:10.1016/j.jpeds.2021.07.021

⁴⁵ Szilagyi, P., Shah, M., Delgado, J., Thomas, K., Vizueta, N., Cui, Y., Vangala, S., Shetgiri, R., Kapteyn, A. (2021). Parents' Intentions and Perceptions About COVID-19 Vaccination for their Children: Results from a National Survey. *Pediatrics* 148(4). doi:10.1542/peds.2021-052335

⁴⁶ Rane, M., Robertson, M., Westmoreland, D., Teasdale, C., Grov, C., Nash, D. (2021). Intention to Vaccinate Children Against COVID-19 Among Vaccinated and Unvaccinated US Parents. *JAMA Pediatr.* doi:10.1001/jamapediatrics.2021.5153

⁴⁷ Centers for Disease Control and Prevention. COVID-19 Vaccination Coverage and Vaccine Confidence among Children: COVIDVaxView. Available at: <https://www.cdc.gov/vaccines/imz-managers/coverage/covidvaxview/interactive/children.html>, last accessed January 28, 2022.

⁴⁸ Rane, M., Robertson, M., Westmoreland, D., Teasdale, C., Grov, C., Nash, D. (2021). Intention to Vaccinate Children Against COVID-19 Among Vaccinated and Unvaccinated US Parents. *JAMA Pediatr.* doi:10.1001/jamapediatrics.2021.5153

⁴⁹ Teasdale, C. A., Borrell, L. N., Shen, Y., Kimball, S., Rinke, M. L., Fleary, S. A., & Nash, D. (2021). Parental plans to vaccinate children for COVID-19 in New York city. *Vaccine*, 39(36), 5082–5086. doi:10.1016/j.vaccine.2021.07.058

adults.⁵⁰ The KFF Vaccine Monitor administered in November 2021 found lower vaccine enthusiasm among non-Hispanic White parents relative to Hispanic or non-Hispanic Black parents,⁵¹ and an October 2021 study of 400 U.S. parents found similar results.⁵² Other studies have also observed higher rates of vaccine hesitancy among parents without a college degree or with lower income.^{53,54}

While understanding and addressing parental vaccine hesitancy represents an important component of increasing the COVID-19 vaccination rate among children, our study may not capture all of the potential barriers to access vaccines for children. A small number of respondents indicated that the vaccine was hard to get or had concerns about missing work; however, other barriers such as transportation are not addressed. Several studies have suggested that these barriers may particularly impact people from racial and ethnic minority groups. A CDC study using HPS data found a lower reported vaccination rate among children of Black parents, but higher reported intention to vaccinate, which the authors suggested may reflect access issues.⁵⁵ Similarly, KFF found that Black, Hispanic, and lower-income parents are more likely to say that they are concerned about missing work to vaccinate their children, will not be able to get the vaccine from a place they trust, or have difficulty traveling to a vaccination site.⁵⁶ Understanding what access barriers exist and identifying ways to minimize access barriers, alongside addressing parental concerns about COVID-19 vaccines, will be important to increase COVID-19 vaccine uptake among children.

Limitations

This analysis does not attempt to include all potential variables that may impact hesitancy to vaccinate children, and hesitancy is not the sole determinant of vaccination decision-making for children. Thus, our estimates should be used with caution when attempting to generalize beyond the factors examined herein. In addition, our estimates should be used in conjunction with other relevant information. Local contextual information, including trends and data related to vaccine access, community morbidity and mortality, social vulnerability, and vaccine administration can provide additional insights and applicability.

We are also not able to link parents' response to a specific child in their household, which limits our ability to examine parental preferences across more disaggregated age categories. Our estimates use individual level responses intended to capture sentiment within different geographic levels in the United States at the time of

⁵⁰ Hamel, L., Lopes, L., Sparks, G., Kirzinger, A., Kearney, A., Stokes, M., Brodie, M. (2021). KFF COVID-19 Vaccine Monitor: September 2021. Available at: <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-september-2021/>, last accessed January 3, 2022.

⁵¹ Hamel, L., Lopes, L., Kearney, A., Stokes, M., Kirzinger, A., Sparks, G., and Brodie, M. (2021). KFF COVID-19 Vaccine Monitor: Winter 2021 Update on Parents' View of Vaccines for Kids. Available at: <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-winter-2021-update-on-parents-views-of-vaccines/>, last accessed December 30, 2021.

⁵² Fisher, C., Gray, A., Sheck, I. (2022). COVID-19 Pediatric Vaccine Hesitancy among Racially Diverse Parents in the United States. *Vaccines* 10(1):31. doi:10.3390/vaccines10010031

⁵³ Szilagyi, P., Shah, M., Delgado, J., Thomas, K., Vizuetta, N., Cui, Y., Vangala, S., Shetgiri, R., Kapteyn, A. (2021). Parents' Intentions and Perceptions About COVID-19 Vaccination for their Children: Results from a National Survey. *Pediatrics* 148(4). doi:10.1542/peds.2021-052335

⁵⁴ Teasdale, C. A., Borrell, L. N., Kimball, S., Rinke, M. L., Rane, M., Fleary, S. A., & Nash, D. (2021). Plans to Vaccinate Children for Coronavirus Disease 2019: A Survey of United States Parents. *The Journal of pediatrics* 237, 292–297. doi:10.1016/j.jpeds.2021.07.021

⁵⁵ Lendon, J., Santibanez, T., Singleton, J., Lee, J. (2021). Confidence in COVID-19 Vaccination of Children aged 12–17 years old, by Sociodemographic Factors and Adult Respondents' Vaccination Status and Intent—Household Pulse Survey, United States, August 18–September 13, 2021. Available at: <https://www.cdc.gov/vaccines/imz-managers/coverage/covidvaxview/pubs-resources/confidence-covid19-vaccination-children.html>, last accessed January 3, 2022.

⁵⁶ Hamel, L., Lopes, L., Kearney, A., Stokes, M., Kirzinger, A., Sparks, G., and Brodie, M. (2021). KFF COVID-19 Vaccine Monitor: Winter 2021 Update on Parents' View of Vaccines for Kids. Available at: <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-winter-2021-update-on-parents-views-of-vaccines/>, last accessed December 30, 2021.

the survey; careful consideration is advised when examining questions outside of the time period or geographic level assessed in this analysis. Due to nonresponse bias, the HPS may not be fully representative of all U.S. adults and survey-based estimates for vaccination rates may not match data from other sources. A full discussion of limitations associated with the HPS can be found in the survey's technical documentation.⁵⁷

Conclusion

The COVID-19 pandemic has had a unique impact on parents and families. The availability of COVID-19 vaccines for children aged 5-17 represents a critical opportunity to reduce risks of COVID-19 to children as well as slow the spread of COVID-19. In this brief, we show that hesitancy to vaccinate children is associated with parental vaccine hesitancy and is higher for children aged 5-11 relative to children aged 12-17. At least 56 percent of parents cite concerns about safety and efficacy as the top reason for hesitancy to vaccinate themselves or their children. There are about 53.9 million^{58,59} children aged 5-17 of which only about 20 million are fully vaccinated (37.2 percent) as of January 27, 2022.^{60,61} This analysis highlights continued opportunities for outreach and education to improve confidence in COVID-19 vaccines.

⁵⁷ US Census Bureau (2021). Source of the Data and Accuracy of the Estimates for the Household Pulse Survey Phase 3.3. Available at https://www2.census.gov/programs-surveys/demo/technical-documentation/hhp/Phase3-3_Source_and_Accuracy_Week40.pdf, last accessed December 30, 2021.

⁵⁸ US Census Bureau (2021). 2020 ACS 1-Year Experimental Data Tables. Table XK2000101. Population by Sex, <https://www.census.gov/programs-surveys/acs/data/experimental-data/1-year.html>

⁵⁹ The population of children aged 5-17 (53,903,602) is estimated using the 2020 population in the US (329,484,119) and the percentage of children aged 5-11 (8.7 percent) and 12-17 (7.6 percent) provided in the CDC 2022 vaccination data by age group report.

⁶⁰ Centers for Disease Control and Prevention. Demographic Characteristics of People Receiving COVID-19 Vaccinations in the United States by Age Group. Data updated as of January 27, 2022. Available at <https://covid.cdc.gov/covid-data-tracker/#vaccination-demographic>.

⁶¹ The percent of 37.2 (=20,040,293/53,903,602) is estimated using the total number of fully vaccinated children aged 5-11 (5,959,545) and 12-17 (14,080,748) divided by the total 2020 population of children 5-17 (53,903,602).

Appendix A

Logistic Regression

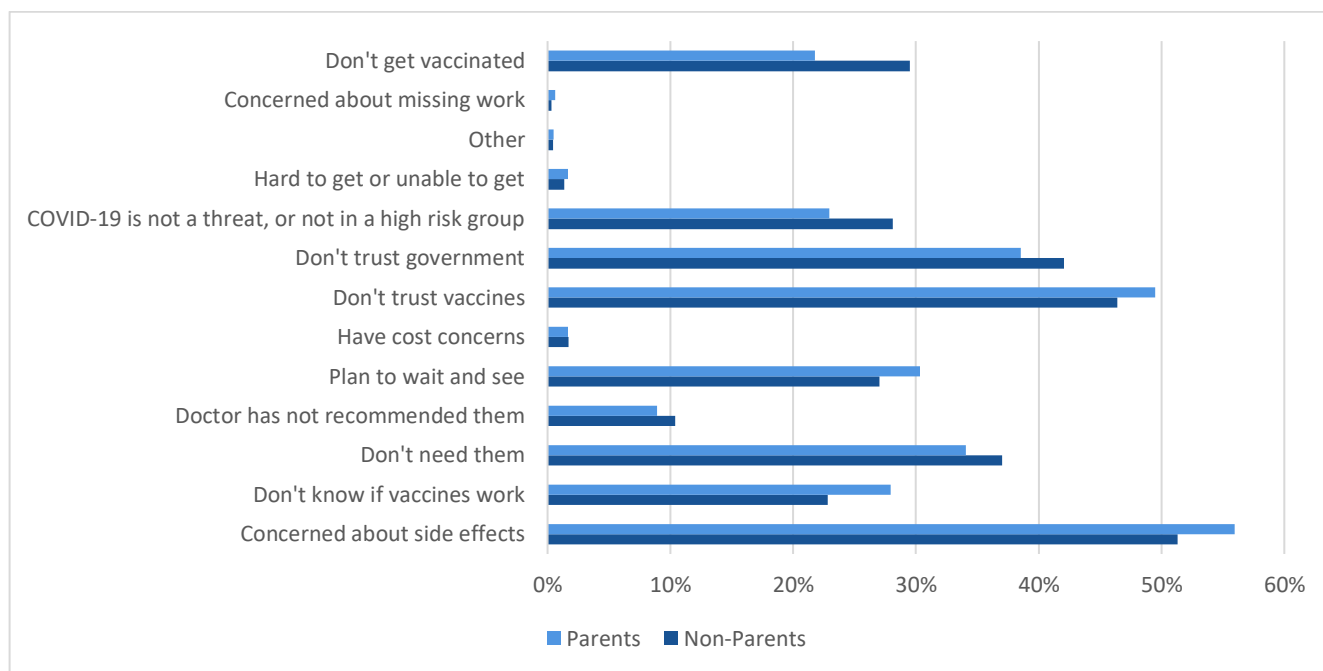
ASPE developed predictions of hesitancy rates using the most recently available Census Bureau’s Household Pulse Survey (HPS). The HPS is designed to produce statistics at the national and state levels and for the 15 largest Metropolitan Statistical Areas. The HPS includes information on U.S. residents’ vaccination for COVID-19, intentions to receive the COVID-19 vaccine when available, intentions to vaccinate children, reasons for hesitancy to receive a vaccine or to vaccinate children, as well as other sociodemographic information. The question about intention to vaccinate children was first introduced in the survey in July 2021 for parents of children aged 12-17 and was expanded to include parents of children aged 5-11 in December 2021. Currently, the survey does not ask parents of children aged 0-4 about intentions to vaccinate. For this analysis, we use the survey fielded between December 1-13, 2021 (“Week 40”).

We use a binary logistic regression model characterized by equation (1) to obtain hesitancy estimates week t :

$$(1) \text{logit}(y_{i,t}^m) = a + d * X + \partial_r + e_{i,t}$$

In equation (1), y_i is equal to one if respondent i indicated that they would “definitely not”, “probably not”, or were “unsure” about getting the COVID-19 vaccine for their children and zero if the response is “definitely”, “probably”, and “yes”. This model is examined for m child age groups (m = children 5-11, children 12-17). X is a set of sociodemographic characteristics for respondent i : age (18-29, 30-39, 40-49, 50+), gender, race/ethnicity (Hispanic, non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, and non-Hispanic Other/Multiple Race), education (no college, college or higher), marital status (married, widowed/divorced/separated, never married), health insurance status (insured, uninsured, missing insurance status), and household income. The model also includes four region indicators, ∂_r , to capture time-invariant region-specific attitudes or patterns. We use survey weights (person and replicates) in both the descriptive and regression analysis to mitigate non-response bias and Fay’s Method for variance estimation. The HPS attempts to minimize nonresponse bias by adjusting weights for potential differences between respondents and nonrespondents. Adjustments are made within each state by age, sex, Hispanic origin, race and educational attainment. However, the weighting adjustments are based on the information available about nonresponding units.

Appendix Figure 1. Reasons for COVID-19 Vaccine Hesitancy among Non-Parents and Parents



Note: "Parents" are defined as any respondent with a child under the age of 18 in the household; "non-parents" are defined as those without a child under the age of 18 in the household.

Source: ASPE analysis of Household Pulse Survey December 1-13, 2021.

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