Evidence brief on parental and adolescent acceptance of COVID-19 vaccine for those aged 1-17

December 2021

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Introduction

What is the evidence on parental, guardian, and adolescent acceptance of the COVID-19 vaccine for children and adolescents aged 1-17 in Canada, Australia, New Zealand, UK, and the USA?

As of December 2021, Canada has one of the highest vaccination rates in the world, with 87% of the population ≥12 years of age having received two doses of the vaccine[1]. In Canada, the COVID-19 vaccine was authorized for use in adolescents aged 12-17 in May 2021, and was recently authorized in children aged 5-11 in November 2021. Authorization for use in adolescents was approved in May-June 2021 in New Zealand, UK, and the US and August 2021 in Australia. For children, approval was authorized in October 2021 in the US and December 2021 in the UK, New Zealand, and Australia.

As parents and guardians will be the ones to accept or reject a vaccine for their child or adolescent, it is important to better understand the factors associated with vaccine acceptance, hesitancy, and refusal. This evidence brief summarizes the literature on parental and guardian intentions to vaccinate their children and adolescents, adolescent intentions to get the vaccine themselves, and associated factors. The focus of the evidence brief is on the Five Eyes countries (Canada, Australia, New Zealand, UK, and US) as these countries tend to have similar trends. This brief contains literature up to December 10, 2021.

Key points

There were 51 studies identified that evaluated parental or guardian acceptance of the COVID-19 vaccine for children and adolescents in Canada (n=14), Australia (n=3), New Zealand (n=2), UK (n=4), and US (n=28) (Table 1). Sixteen of the studies were conducted since the approval of the vaccine in adolescents aged 12+ in

their respective countries and the remaining 35 were conducted prior to the approvals in 2020 and early 2021. One systematic review conducted in August 2021 was identified and used to cross check included studies and results of this evidence brief (Table 3)[2].

- In Canada, parental intentions to vaccinate children and adolescents have steadily increased since the approval of vaccines for children and adolescents in three longitudinal studies[3 4 5]. Similar trends were seen in New Zealand and the UK[6 7].
- The latest studies conducted in Canada in November-December 2021 show that 46-62% of parents with children aged 5-11 have either vaccinated their children or intend to soon, 16-17% would prefer to wait, 7-11% were undecided, and 10-23% do not intend to vaccinate their children[3 4 5]. For parents with adolescents aged 12-17, 80-90% have either vaccinated their adolescents or intend to soon, 5% would prefer to wait, 2-7% were undecided, and 7-8% do not intend to vaccinate their adolescents[3 5].
- Parents were more willing to accept a COVID-19 vaccine for themselves than for their children and adolescents[8 9 10 11 12 13 14 15 16 17 18 19].
- Parents with younger children (aged 1-11) were more hesitant to get their children vaccinated compared to those with adolescents aged 12-17[6 19 20 21 22 23 24 25 26].
- Parental and child vaccine intentions are highly correlated with each other, with parents who had taken or were intending to take a vaccine more likely to intend to vaccinate their children and adolescents[9 21 23 24 25 26 27 28 29 30 31 32 33 34 35 36].
- Similar to the general population, parents from lower-income households[15182124252630323637383940414 2], who are younger [14 15 24 26 28 33 37 38 43 44], less educated[9 12 14 21 23 24 26 28 33 36 37 38 39 42 45], have a history of not accepting other childhood vaccines[9 14 15 23 26 28 32 34 39 43 46], who are female[7 14 21 24 26 28 33 37 38 45], and ethnic minorities[8 14 15 24 25 28 33 41 45 47] were less likely to intend to vaccinate their children and adolescents.
- Concerns over vaccine side effects, long-term effects, and a rushed vaccination process were reported as barriers to intending to vaccinate children and adolescents [5 15 17 19 21 22 23 24 25 27 32 35 36 37 39 45 48 49 50 51 52 53 54 55 56]. Another common reason for vaccine hesitancy was the belief that the risk of COVID-19 in children and adolescents is low [5 22 24 51], they would not get seriously ill from COVID-19[25 45], or the vaccine was unnecessary[21 32 37 56].
- These trends did not differ between parents of children (<12) or adolescents (12-17).

Vaccine attitudes in adolescents aged 12-17 were explored in 7 studies, of which 3 were conducted in the UK and 4 in the US (Table 2). Six of the studies were conducted since the approval of the vaccine in adolescents aged 12+ in May-June 2021 and the remaining study was conducted prior to the approvals in early 2021.

- A longitudinal study in the UK found that intentions for adolescents aged 16-17 in the UK to accept a vaccine for themselves has increased since the approval of the vaccine[57].
- Similar to parental intentions to vaccinate their children and adolescents, adolescents who already had the vaccine or intended to get vaccinated were older, had parents with higher household incomes and education, fewer doubts about the necessity of the vaccine, and lower levels of safety or efficacy concerns than adolescents who did not intend to get vaccinated[58].
- Hours of TV watched on a school day was significantly associated with vaccine hesitancy in adolescents aged 12-15 in a US study[59].
- Two studies found that misinformation, fear of side-effects, and conspiracy theories were reasons impacting vaccine hesitancy in adolescents[60 61].

Overview of the evidence

Fifty-one studies pertaining to parental COVID-19 vaccine attitudes and intentions for their children and adolescents and 7 studies on adolescent attitudes and intentions to vaccinate themselves were identified and included in this review. Of these, 10 are preprints and 13 are reports which have not completed the peer-review process. This report focuses on evidence on parental COVID-19 vaccine acceptance for children and adolescents in the Five Eyes countries (Canada, Australia, New Zealand, UK, and US).

The publications reporting on parental COVID-19 vaccine attitudes are mainly observational studies (e.g., cross-sectional study using an online survey) with one randomized controlled trial exploring the impact of different messaging on intention to vaccinate children and adolescents.

A formal risk of bias evaluation was not conducted. Across observational studies the reliability of the outcome is based on obtaining a representative sample of the target population that is sufficiently large to obtain a representative spectrum of results. Studies frequently did not demonstrate the representativeness of their samples to the target population in both grey literature or government reports published online (not indexed), preprints (scientific publications that have not undergone peer-review) and published journal articles. Longitudinal studies where a population was sampled more than one time to monitor changes in vaccine intentions and attitudes over time were the strongest observational study design identified. Most observational studies were cross-sectional online surveys at a single point in time. These study designs are at moderate/high risk of bias and thus, are considered medium-low quality depending on the sample size and whether the sample represents the target population as well as how well the survey tool can measure the outcome(s) of interest (e.g., was it informed by formative research, validated and pretested prior to implementation). For most of the included studies the outcomes are self-reported, which can be biased by response and social desirability biases. Other biases considered in these studies include response rate and missing data. While there are many studies that show similar trends, the conclusions could change with additional research, larger sample size, different sampling strategies, data collection tools, and progression through the pandemic.

A key knowledge gap in this research are studies that address parental vaccine intentions and reasons for hesitancy and refusal rates in high-risk and underserved populations, and studies which give insights into factors that would encourage parents to vaccinate their children. The majority of studies used online surveys, and to a lesser extent telephone surveys, which may limit participation from segments of population due to lack of access to technology. While the adolescent vaccine rollout has been underway for over half a year, the child (5-11) vaccine was recently implemented. Therefore, there have been minimal studies released on parental intentions to vaccinate their children and reasons for refusal. This information is crucial to determine why parents are accepting or refusing vaccinations to continue developing strategies to encourage vaccine uptake in those parents who are hesitant.

COVID-19 vaccine attitudes of parents

Vaccine attitudes of parents were explored in 51 studies. There were 14 studies in Canada, 3 in Australia, 2 in New Zealand, 4 in the UK, 28 in the US, and 5 global studies that included at least one of these countries (Table 1). Sixteen of the studies were conducted in since the approval of the vaccine in adolescents aged 12+ in their respective countries and the remaining 35 were conducted prior to the approvals in 2020 and early 2021. One systematic review conducted in August 2021 was also identified (Table 3)[2]. High level points from all studies are listed below and detailed outcomes for the studies are located in the Appendix (Table 1).

Intentions to vaccinate children and adolescents in Canada, New Zealand, and the UK have steadily increased since the approval of vaccines for children and adolescents in five longitudinal studies[34567].

- The latest studies conducted in Canada in November-December 2021, show that 46-62% of parents with children aged 5-11 have either vaccinated their children or intend to soon, 16-17% would prefer to wait, 7-11% were undecided, and 10-23% do not intend to vaccinate their children[3 4 5]. For parents with adolescents aged 12-17, 80-90% have either vaccinated their adolescents or intend to soon, 5% would prefer to wait, 2-7% were undecided, and 7-8% do not intend to vaccinate their adolescents[3 5].
- In a Canadian study conducted in September-October 2021, the highest level of parents who will not vaccinate their children aged 5-11 were in QC (30%), AB (29%), and SK/MB (26%). The lowest levels of parental hesitancy were seen in BC (15%), the Atlantic provinces (15%), and ON (18%)[42].
- Twelve studies reported participants were more willing to accept a COVID-19 vaccine for themselves than for their children and adolescents[8 9 10 11 12 13 14 15 16 17 18 19]. Three studies showed parents were more likely to vaccinate their children and adolescents compared to themselves[38 44 62].
- Parents with children aged 1-11 were more hesitant to get their children vaccinated compared to those with adolescents aged 12-17[6 19 20 21 22 23 24 25 26].
- Parental and child/adolescent vaccine intentions are highly correlated with each other, with parents who had taken or were intending to take a vaccine more likely to intend to vaccinate their children and adolescents[9 21 23 24 25 26 27 28 29 30 31 32 33 34 35 36].
- A global study in June 2021 reported parents' willingness to vaccinate children was 66.9% in Canada, 63.2% in the UK, and 57.6% in the US. In other countries, highest intentions were reported in China (95%) and Brazil (91.3%), and lowest intentions in Russia (35.5%) and Poland (46.3%)[31].
- Intentions of parents to vaccinate children with co-morbidities (asthma, chronic lung disease, and childhood cancer survivors) was assessed in three studies[19 53 63]. Australian parents of children with chronic lung disease had higher intentions to vaccinate their children than parents of children with no co-morbidities in another Australian study conducted in January 2021[17 53]. Parents of children with asthma and childhood cancer survivors believed their children were at greater risk of COVID-19 complications compared to others[19 63].

Barriers and facilitators to parents accepting a vaccine for their children and adolescents are similar to accepting a vaccine for themselves[64].

- Similar to the general population, parents from lower-income households[151821242526303236373839404142], who are younger[14 15 24 26 28 33 37 38 43 44], less educated[9 12 14 21 23 24 26 28 33 36 37 38 39 42 45], have a history of not accepting other vaccines for their children[9 14 15 23 26 28 32 34 39 43 46], who are female[7 14 21 24 26 28 33 37 38 45], and ethnic minorities[8 14 15 24 25 28 33 41 45 47] were less likely to intend to vaccinate their children and adolescents. A systematic review conducted in August 2021 had similar findings[2].
- Concerns over vaccine side effects, long-term effects, and a rushed vaccination process were reported as barriers to intending to vaccinate children and adolescents[5 15 17 19 21 22 23 24 25 27 32 35 36 37 39 45 46 48 50 51 52 53 54 55 56]. Another common reason for vaccine hesitancy was the belief that the risk of COVID-19 in children and adolescents is low[5 22 24 51], they would not get seriously ill from COVID-19[25 45], or the vaccine was unnecessary[21 32 37 56].
- Parents had variable responses with regard to motivating factors for getting their children and adolescents vaccinated, from wanting to keep their child/adolescent (92%) or community (66%) safe[22] to becoming mandatory for extra-curricular activities or attending school (13.2%-61%)[22 35 45 54].
- These trends did not differ between parents of children (<12) or adolescents (12-17).

Attitudes towards COVID-19 vaccination coverage

- In a study of parents across Canada in August 2021, support for mandatory vaccination was high for all school staff (74% of parents of adolescents aged 12-17 and 81% of parents of children aged 5-11) and students (65% of those with adolescents aged 12-17 and 71% with children aged 5-11). Those living in Ontario and British Columbia had higher levels of support for mandatory vaccination in school staff and students compared to Quebec and the Prairies. At the time of this study, the vaccine was not available for children <12[65]. Three other Canadian studies found that 29-55% of parents disagreed with making vaccination mandatory to attend school or vaccine passports for children[4 54 66].
- Across two studies in Canada and the US, the preferred location to receive the COVID-19 vaccine for children and adolescents was a primary health care provider[35 45]. Most parents (48-85%) would be uncomfortable with either schools or pharmacists vaccinating their children and adolescents[35 45].
- A qualitative study in the UK conducted in July 2021 revealed that familial and friend norms against vaccination as well as perceived opposition from friends and family if vaccines were offered to children impacted parents thoughts about vaccinating children[67].

COVID-19 vaccine attitudes of adolescents

Vaccine attitudes in adolescents aged 12-17 were explored in 7 studies, of which 3 were conducted in the UK and 4 in the US (Table 2). Six of the studies were conducted in since the approval of the vaccine in adolescents aged 12+ in May-June 2021, and the remaining one was conducted prior to the approvals in early 2021. High level points from all studies are listed below and detailed outcomes for the studies are located in the Appendix (Table 2).

Intentions for adolescents to accept a vaccine for themselves in the UK have steadily increased since the approval of vaccines for adolescents in one longitudinal study[57].

- In a UK survey, 64% of hesitant adolescents aged 16-17 who received at least one dose of the vaccine got vaccinated because they wanted restrictions to ease and life to get back to normal[57]. Of those who were hesitant and had not been vaccinated, 18% were worried about their ability to have children, and 50% reported that no vaccine incentives would increase their likelihood of getting vaccinated[57].
- Hours of TV watched on a school day was significantly associated (p=0.048) with vaccine hesitancy in adolescents aged 12-15 in a study conducted in May 2021 in Arkansas, US[59].
- Two studies found that misinformation, fear of side effects, and conspiracy theories were reasons impacting vaccine hesitancy in adolescents[60 61].
- Similar to parental intentions to vaccinate their children and adolescents, adolescents who already had the vaccine or intended to vaccinate were older, had parents with higher household incomes and education, fewer doubts about the necessity of the vaccine, lower levels of safety or efficacy concerns than adolescents who would not be vaccinated[58].

Methods

Publications and Preprints

A daily scan of the literature (published and pre-published) is conducted by the Knowledge Synthesis team in the Emerging Science Group, Public Health Agency of Canada. The scan has compiled COVID-19 literature since the beginning of the outbreak and is updated daily. Searches to retrieve relevant COVID-19 literature are conducted in Pubmed, Scopus, BioRxiv, MedRxiv, ArXiv, SSRN, Research Square, and and cross-referenced with the COVID-19 information centers run by Lancet, BMJ, Elsevier, Nature and Wiley. The cumulative scan

results are maintained in a Refworks database and an excel list that can be searched. Targeted keyword searching is conducted within these databases to identify relevant citations on COVID-19 and SARS-COV-2. Search terms used included: ("vaccin*" or "immuni*") and ("parent*" or "child*" or "caregive*" or "guardian" or "kid*" or "youth*" or "teenager" or "adolescent*"). This review contains research published up to December 10, 2021.

Grey Literature

A grey literature search was conducted to compliment the database search. The grey literature search focused on targeted governmental and academic institutions. A detailed list of websites searched is available upon request. The grey literature search was conducted December 5-10, 2021.

Each potentially relevant reference was examined to confirm it had relevant data and relevant data was extracted into the review.

Acknowledgments

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Editorial review, science to policy review, peer-review by a subject matter expert and knowledge mobilization of this document was coordinated by the Office of the Chief Science Officer: ocsoevidence-bcscdonneesprobantes@phac-aspc.gc.ca.

Evidence tables

Table 1: Evidence of parental acceptance of COVID-19 vaccine for children and adolescents (n=51)

Study	Methods & survey tools	Key knowledge attitudes and behaviours (KAB) outcomes
Canada (n=14)		
Abacus Data (2021) [3 68] grey literature Longitudinal study Canada Oct- Dec 2021	An online survey using a random sample of adults across Canada (18+) was used to measure opinions throughout the pandemic including intention to vaccinate children and adolescents. Oct 2021, n= 1500 (parents: 157 with adolescents aged 12-17/285 with children <12) Nov-Dec 2021, n=3532 (parents: 434 with adolescents aged 12-17/461 with children <12)	**November-December 2021** **5-11 year olds** • 21% reported their children aged 5-11 have been vaccinated, 41% will get the vaccine as soon, 17% would prefer to wait, 11% have not decided, and 10% will not vaccinate their children. • 83% of parents who are hesitant or unlikely to vaccinate their children aged 5-11 have had one or more doses of the vaccine. **12-17 year olds** • 64% reported their adolescents aged 12-17 have received at least one dose (up 5% from Oct), 16% will get it as soon as possible (down 4%), 5% would prefer to wait (down 3%), 7%

		are undecided (no change), and 8% will not get vaccinated (up 2%). • 40% of parents who are hesitant or unlikely to vaccinate their adolescents aged 12-17 have been vaccinated. **October 2021** **5-11 year olds** • 46% will get their children <12 vaccinated as soon as it's available, 22% would prefer to wait and see, 6% don't plan on vaccinating but could be persuaded, 9% were unsure, and 17% will not vaccinate. **12-17 year olds** • 59% of parents reported their adolescents aged 12- 17 have received at least one dose, 20% will get it soon, 8% wanted to wait, 7% have not decided, and 6% will not get them vaccinated.
Angus Reid (2021) [4 42 65 69] grey literature Longitudinal study Canada Sep-Dec 2021	Vaccine intentions and perceptions were analyzed in parents and the general population using an online survey across a representative randomized sample who are members of Angus Reid Forum. Aug 2021 (n=804 parents of adolescents aged 12-17 and 122 parents of children 5-11) Sep-Oct, 2021 (n= 5011, 812 parents of children 5-11) Nov 3- 7, 2021 (n = 1611) Nov 26 – Dec 1, 2021 (n=3516, 250 parents of children 5-11)	**November** **5-11 year olds** • Parental intention to vaccinate their children aged 5-11 as soon as possible increased to 54% (up 3% from Sep-Oct), 16% will eventually vaccinate (down 2%), 23% will not vaccinate (no change), and 7% were unsure (down 2%). • 55% believed it goes too far to require children to be vaccinated to go school, 38% agreed with vaccination requirements, and 6% were unsure. • 43% want Canada to focus on vaccinating children and third doses compared to 41% who want the focus to be on vaccinating less wealthy countries. • Focusing on vaccinating children and third doses was more popular among those aged 55+. **September – October** **5-11 year olds** • 51% of parents will get their children vaccinated right away, 18% want to wait before vaccinating, 23% will not vaccinate, and 9% were unsure.

		• The highest level of parents who will not vaccinate their kids were in QC (30%), AB (29%), and SK/MB (26%). • Unwillingness to vaccinate children was higher in households making between $50-99K (28%) compared to those making > $100K (19%). 24% of households making less than $50K want to wait a while before vaccination. • Parents with high school (26%) or college education (25%) had lower intentions to vaccinate their children compared to those with a university education (15%). **August** • In parents with adolescents aged 12-17, 82.7% reported they have been vaccinated, 13.6% have not been vaccinated yet, and 3.6% preferred not to say. • Support for mandatory vaccination for all school staff was high (74% of parents of adolescents aged 12-17 and 81% of parents of children aged 5-11). • 65% of those with adolescents aged 12-17 and 71% with children aged 5-11 wanted to see vaccine mandates for students as well. At the time of this study the vaccine was not available for children <12. • 33% of parents living in the Prairies and 25% of those in QC believed that neither masks nor vaccines should be mandatory for students. This was higher than BC (11%) and ON (17%). • 61% of parents with unvaccinated adolescents and 85% of those who prefer not to say did not believe that masks or proof of vaccination should be required for students compared to 12% of parents with vaccinated adolescents. Similar trends were seen for school staff requirements. • More parents whose adolescents had been vaccinated were concerned about them getting sick (63%) compared to those that haven't had their adolescents vaccinated (32%).
Leger (2021) [66] grey literature	An online survey of 1001 adults in Ontario evaluated opinions on vaccine passports for children aged	**5-11 year olds** • 62% of respondents with children in their households either strongly or somewhat

Cross-sectional study Canada Nov 2021	5-11 when vaccines are approved for this age group.	supported requiring 5-11 year olds to show proof of vaccination compared to 65% of childfree houses, 32% of households with children opposed passports, and 6% were unsure. • Support for vaccine passports for 5-11 year olds was higher among those with no kids in their household, those over the age of 55, and those living in Greater Toronto area. • Support was lower in the North region and among those who support the Progressive Conservative Party of Ontario. • 68% of respondents either strongly or somewhat supported requiring vaccination to attend in person class for children if the vaccine is approved for their age, 23% opposed, and 9% were unsure. • Support for requiring vaccination for in-person class was lower among those with children in their household, those in the Hamilton/Niagara region and North region, those over the age of 55, and those who support the Green party or Progressive Conservative Party.
INSPQ (2021) [5] [70] [71] [72] [73] [74] [75] [76] [77] [78] [79] grey literature Longitudinal study Canada Jun-Nov 2021	Analysis of the acceptability of vaccination against COVID-19 in children and adolescents was evaluated using an online survey of adults and HCWs in Quebec. Number of participants was not clearly stated (~3300 each collection period). Articles in French. There were multiple collection periods: Early June 2021 Mid June 2021 Late July 2021 August 2021 Late Aug - Sep 2021 Mid Sep 2021 Late September 2021 Early October 2021 Mid October 2021	**November** **5–11 year olds** • Intention to vaccinate children aged 5-11 was 46%, up from earlier in month (42%), and similar to late October (47%). • The main reasons among those who do not intend to vaccinate children aged 5-11 were not seeing the usefulness because the risk of COVID-19 is low for children (39%), side effects (30%), and the newness of the vaccine (11%). **12-17 year olds** • 80% of adolescents aged 12-17 have received both doses (no change since last polling), 6% have had one dose (up 2%), 4% intended to vaccinate (down 1%), 7% had no intention (down 3%), and 2% were unsure (no change). • The main reasons among those who did not intend to vaccinate were not seeing the usefulness because the risk of COVID-19 is low

	October-November 2021 Mid November 2021	for adolescents (55%), side effects or newness of the vaccine (12%), and other reasons (7%). **October** **5–11 year olds** • Intention to vaccinate children aged 5-11 increased from early to mid October from 44% to 47%. • The top reasons for vaccine hesitancy were not seeing the usefulness because the risk of COVID-19 is low for children (39%), concern of side effects (25%), and the newness of the vaccine (16%). **12-17 year olds** • 70% of parents with adolescents aged 12-17 totally agree that they intended to vaccinate, 12% somewhat agreed, 4% somewhat disagreed, 10% totally disagreed, and 4% were unsure. **September** • In late September, 83% of parents intended to vaccinate their children, 12% have no intention, and 4% do not know. • In early September, 86% of parents intended to have their children vaccinated, 12% had no intention, and 2% were unsure. This represents a 3% increase from mid August. **August** • 83% of parents intended to vaccinate their children (down from 86% at last polling), 12% did not intend to vaccinate (up from 10%), and 6% were unsure (up from 4%). **July** • 87% of parents intended to vaccinate their children (up 1% from June), 11% had no intention (up from 8%), and 3% were unsure (down from 6%). **June** • Parental intention to vaccinate in late May/early June fell to 69% (down 3% from last poll), 19% of parents do not intend to vaccinate (up 2%), and 12% were unsure (up 1%).

		• Of those who do not intend to vaccinate their children, the top reasons were not seeing the benefit because of the low risk for children (25%), worry over the newness of the vaccine (24%), and concerns about side effects (22%).
Saskatchewan Population Health and Evaluation Research Unit (2021) [80] grey literature Cross-sectional study Canada Sep-Oct 2021	The online Social Contours and COVID-19 Survey was used to evaluate if the proof-of-vaccination policy increased vaccine uptake in Saskatchewan. The number of individuals evaluated is not clearly stated.	**12-17 year olds** • First and second vaccine dose uptake among 12-17 year olds significantly increased after announcement of proof of vaccination requirements. • Uptake did not significantly increase or decrease after the actual implementation of proof-of-vaccination.
Leger (2021) [35] grey literature Cross-sectional study Canada Sep 2021	An online survey of 460 (434 of which are parents) Manitobans was conducted to measure vaccine hesitancy and attitudes towards vaccinating children and adolescents (<12 years and 12-17).	**5-11 year olds** • 75% of parents would vaccinate their children <12, 10% would not, and 15% were unsure. • Parents who were vaccinated were more likely to want to vaccinate their children (81% of vaccinated parents vs 0% of unvaccinated parents). • 48% of parents of children < 12 would be uncomfortable with vaccination in schools. • 84% of parents of children <12 were comfortable getting their children vaccinated at a primary health care provider. **12-17 year olds** • 81% of parents reported their 12-17 year olds were fully vaccinated or will soon be and 13% were not vaccinated. • 25% of unvaccinated parents' report that their 12-17 year olds have been or will be vaccinated compared to 93% of vaccinated parents. • The major reasons for not vaccinating were concerns that there wasn't enough testing (62%), and worry about long term effects (62%).

		• 62% reported that religious or cultural views were not a factor for not getting their 12-17 year olds vaccinated and 38% reported this was a major or minor factor. • 30% of parents of 12-17 year olds were comfortable getting them vaccinated at a primary health care provider. 85% would be uncomfortable with either schools or pharmacists vaccinating their 12-17 year olds • 14% of parents would be swayed to vaccinate if it was required for participation in extra curricular (71% no impact and 14% were unsure).
Ipsos and Toronto Public Health (2021) [54] grey literature Longitudinal study Canada Mar-Aug 2021	To gain a better understanding of the public's views on vaccination, an online survey was conducted in Toronto residents with an over sampling of recent immigrants. Wave 1: Mar- Apr, n=1,200 Wave 2: Jul-Aug, n=1,203	**July-August** • 69% of parents with adolescents >11 years old reported they had received at least one dose, 8% were intending to vaccinate their adolescents, 19% were unsure, and 7% did not want their adolescents vaccinated. • The top reasons for parents not wanting to vaccinate their children or adolescents were concern about side effects (56%), long-term effects (48%), and lack of trust in how quickly the vaccine was developed (40%). • In parents of children <12, 47% were very likely to get their children vaccinated when available, 17% were somewhat likely, 9% were somewhat unlikely, 17% were very unlikely, and 10% were unsure. • 66% and 64% of parents agreed that COVID-19 vaccines should be mandatory for children and adolescents who want to return to in-person learning in schools and mandatory for children to participate in extra curricular activities, respectively.
Government of Manitoba (2021) [30] grey literature Cross-sectional study	An online research panel of 600 Manitobans were surveyed to understand attitudes towards vaccination and possible incentives to increase uptake. Of these, 70 were parents.	• In a group of 70 parents or guardians of adolescents aged 12-17, 15% were not sure if they will vaccinate their adolescents, and 13% will not vaccinate. • Those who did not intend to vaccinate their adolescents were in households making less than $40,000, would not get the vaccine themselves, and didn't believe adults should get all the regular vaccines.

Canada May 2021		
McKinnon (2021) [25] Cross-sectional study Canada May-Jun 2021	The social determinants of parental COVID-19 vaccine acceptance was evaluated using an online survey in 809 parents with children and adolescents aged 2-18 in Montreal.	• 13.6% of children and adolescents had received at least one dose of vaccine, 59.7% were very likely, 14.3% somewhat likely, and 12.4% unlikely to have them vaccinated. • Among parents, 90% were vaccinated with at least one dose, with 7% likely and 3% unlikely to get vaccinated. Of the 25 parents unlikely to accept a vaccine for themselves, 22 were also unlikely to accept a vaccine for their child or adolescent. • The younger the child, the less likely the parent was to accept a vaccine for their child. 19.1% of parents with 2-4 years olds were unlikely to vaccinate compared to 12.1% with 9-11 year olds, and 3.8% with 15-18 year olds. • Concern over the lack of information about the vaccine's safety and possible side effects was the most common reason for hesitancy (71%) followed by belief their child/adolescent would not get seriously ill from COVID-19 (36%). • Parents who had lower incomes (aPR 0.78, 95% CI: 0.68-0.87), were born outside of Canada (aPR 0.81, 95% CI: 0.71-0.91), and were not White (aPR 0.92, 95% CI: 0.79-1.05) were less likely to accept a vaccine for their child or adolescent. • In Montreal North (most deprived neighbourhood), child/adolescent vaccine uptake was half that for the West Island (least deprived neighbourhood) (aPR 0.48, 95% CI: 0.18-0.77).
Humble (2021) [32] Cross-sectional study Canada Dec 2020	Intention to vaccinate children and adolescents aged 0-17 and perceptions of the vaccine were evaluated in a group of 1702 parents across Canada.	• If a safe and effective vaccine was available, 64.6% of parents would accept a vaccine for themselves and 63.1% would accept one for their children and adolescents. • Parents with low intention to vaccinate themselves were 9 times less likely to vaccinate their children and adolescents when available compared to parents who intended

		to vaccinate themselves (aOR 9.22, 95% CI: 6.43–13.34). • 77.9% of parents would not get their children and adolescents vaccinated if the vaccine had not been originally tested in this population. • Lower intentions to vaccinate their children and adolescents were observed in parents of children and adolescents who did not receive the influenza vaccine pre-pandemic (aOR 1.51, 95% CI: 1.04-2.21), parents who were employed part-time (aOR 1.73, 95% CI: 1.06-2.84), parents who reported the COVID-19 vaccine was unnecessary (aOR 2.59, 95% CI: 1.72-3.91), and parents who lacked confidence in the safety of the vaccine (aOR 4.21, 95% CI: 2.96-5.99) compared to their counterparts. • Parents who mostly spoke languages other than English, French, or Indigenous languages at home had higher intentions to vaccinate their children and adolescents compared to parents who spoke English (aOR = 0.55, 95% CI: 0.32–0.92).
Vallis (2021) [13] Cross-sectional study Canada Jun-Oct 2020	Attitudes and concerns towards COVID-19 vaccination in individuals living with overweight and obesity were evaluated using an online survey. Two samples were used: 1) representative sample of 1089 individuals living with overweight and obesity and 2) convenience sample of 980 individuals recruited from obesity clinical services or patient organizations.	• 64.6% of those living with obesity were comfortable receiving a vaccine and 35.4% were hesitant. • Individuals were less comfortable with their children receiving the vaccine (58.5% comfortable, 41.6% hesitant, P<0.001).
Drouin (2021) [9] preprint Cross-sectional study Canada Aug 2020	Parental intention to have their child with asthma vaccinated against COVID-19 was assessed using an online survey in 305 parents.	• 63% of parents were likely to have their child vaccinated, 19.1% were unlikely, and 17% were unsure. For themselves, 64% were likely to get vaccinated, 21% were unlikely, and 15.1% were unsure. There was a strong relationship between a parents' intention to vaccinate their children and person intention to vaccinate. • Factors significantly associated with a parents' decision to vaccinate their child included higher level of education, being employed, sex of the child (female), presence of other

		chronic diseases, prior influenza vaccination, parental anxiety, and consultation with a health professional.
Lackner (2021) [43] Cross-sectional study Canada May-Jun 2020	The demographic, experiential, and psychological factors associated with the anticipated likelihood and speed of having children receive a COVID-19 vaccine was investigated in 455 families (857 children).	• Factors associated with a higher likelihood of having their children vaccinated include older parental age, living in the Prairies (relative to Central Canada), more complete child and parental vaccination history, positive attitudes towards vaccines in general, higher psychological avoidance of the pandemic, and a greater tendency to prioritize the risks of the disease relative to the risks of side-effects. • In some models, perceived COVID-19 risk and higher levels of state anxiety were associated with increased likelihood of having children vaccinated. • The above factors were also predictors of faster speed of intended vaccination. However, higher SES was a trend-level predictor.
Hetherington (2021) [39] Cross-sectional study Canada May-Jun 2020	Participants from the longitudinal cohort study All Our Families (n=1321) in Alberta were invited to participate in an online COVID-19 impact survey to understand factors associated with COVID-19 vaccine intentions among parents of 9-12 year old children.	• 60.4% of parents intended to vaccinate their children, 8.6% said they did not intend to vaccinate, and 31% were unsure. • Participants with less education were more likely to not want to vaccinate (OR 2.80, 95% CI: 1.78-4.40) or be unsure (OR 1.98, 95% CI: 1.47-2.71). A similar pattern was seen for income. • History of partial or non-vaccination was associated with intent to not vaccinate (OR 2.81, 95% CI: 1.78-4.40). There was no association between vaccination history and uncertainty regarding a COVID-19 vaccine (OR 1.29, 95% CI: 0.92-1.80). • Concerns over vaccine safety and efficacy, long-term effects, and a rushed vaccination process were reported.
Australia (n=3)		
Evans (2021) [17] Mixed-methods study Australia	Parents (n=1094) intention to vaccinate their children and adolescents aged 18 or younger was evaluated using an online survey. A thematic analysis was also conducted using open-ended questions about reasons and	• 48.3% of parents were willing to vaccinate their children and adolescents, 38% were undecided, and 13.8% said they would not vaccinate.

Jan-Feb 2021	concerns about vaccinating their children.	• Parents were more likely to accept a vaccine for themselves compared to for their children and adolescents. • Parents who were less likely to accept a vaccine for their child/adolescent were less likely to trust doctors ($p<0.001$). • Although most predictors of intention to vaccinate were not significant, the predictors of parents' intentions to vaccinate their children and adolescents were the same as for themselves. • The qualitative data revealed that many parents had not yet made a firm decision to vaccinate their children and adolescents. Reasons for hesitancy included concerns about testing, side effects, and long-term outcomes. Parents also expressed a strong desire to protect their children and adolescents, and an eagerness for more health information.
Homaira (2021) [53] Cross-sectional study Australia Nov 2020 – Jan 2021	Intention to vaccinate children with chronic lung disease (CLD) and reasons for accepting or rejecting a vaccine was evaluated in 198 parents.	• 77% of parents were likely to get their child with CLD vaccinated, 9% were unlikely, and 14% were unsure. • The general practitioner's clinic (58%, n=181) or the hospital (36%, n=181) was the preferred location to get their children with CLD vaccinated. • Parents who were likely to have their child with CLD vaccinated stated they would do so if it was recommended by the child's pediatrician/specialist physician (94%, n=167) and/or general practitioner (80%, n=167). Other top reasons to vaccinate were being able to travel or visit public and private places (87%, n=169) and preventing child from getting COVID-19 (85%, n=171). • The most common concerns in those who were not willing to vaccinate their children with CLD were side effects (83%, 34/41) and that the vaccine might not be tested properly in children public rollout (68%, 27/40).

Rhodes (2020) [37] Cross-sectional study Australia Jun 2020	Parents' intentions to vaccinate was explored using an online survey in 2018 adults (18+).	• Compared to an earlier estimate from an Australia study[81] the weighted proportion of people in this study who indicated that they were unsure or unwilling to accept a COVID-19 vaccine increased by 10.0% (14.2% in April to 24.2% in June, 95% CI 7·9–12·1, p<0.0001.) • Of the parents who were unsure (16.7%) or unwilling (7.6%) to accept a COVID-19 vaccine, 82.8% were concerned about vaccine efficacy and safety and 26.9% believed that a COVID-19 vaccine was unnecessary. • Women (OR 0.63; 95% CI: 0.50-0.80) and people with a lower socioeconomic status (OR 0.82; 95% CI: 0.54-1.23) are less likely to accept a COVID-19 vaccine than men and people with a higher socioeconomic status. • Being < 60 years of age, having a lower level of education, and having inadequate knowledge about the recommended actions required by a person who developed COVID-19 symptoms were associated with vaccine hesitancy.
New Zealand (n=2)		
Horizon Research (2021) [6 10 11 29 47 52 56 82 83 84 85] grey literature Longitudinal study New Zealand Sep-Dec 2020 and Mar-Oct 2021	An online survey of adults (16+) was conducted to measure vaccine intentions and parental vaccine intentions for children and adolescents. The number of parents was not reported. Sep 2020, n=1,451 December 2020, n=1,438 Mar-Apr 2021, n=1,350 Apr-May 2021, n=1387 May 2021, n=1,234 June 2021, n=1,472 July 2021, n=2,509 August 2021, n=2,334 September 2021, n=2,479 October 2021, n=799 November 2021, n=2,447	**November 2021** • 78% of parents with adolescents aged 12-15 would allow them to be vaccinated (stable from October). • 68% of parents with children aged 5-11 would allow their children to be vaccinated (up 5%). **October 2021** • Māori parents were slightly less willing to accept a vaccine for their children and adolescents aged 5-11 (57%), 12-15 (75%), and 16-17 (79%) compared to other ethnicities. **September-October 2021** • 78% of parents with adolescents aged 12-15 would allow them to be vaccinated (up 5% from July). • 63% of parents with children aged 5-11 would allow their children to be vaccinated.

		• Parents who had both 5-11 year olds and 12-15 year olds were a little more likely than the overall average to allow their 5-11 year olds to be vaccinated. **August 2021** • 73% of parents with adolescents aged 12-15 would allow them to be vaccinated (up 6% from July). • 74% of parents with adolescents aged 16-17 would allow them to be vaccinated (up 3% from July). • In addition to safety and long-term effect concerns, 26% did not see a need for adolescents to be vaccinated (up 9% from June). • Pasifika and "Other European" parents were the least likely to allow their 12-17 year olds from taking the vaccine. This was also reported in the June and July surveys. **July 2021** • 67% of parents with adolescents aged 12-15 would allow them to be vaccinated (up 8% from June). • 71% of parents with adolescents aged 16-17 would allow them to be vaccinated (3% down from June). • In addition to safety and long-term effect concerns, 17% did not see a need for adolescents to be vaccinated (down 5% from June). **June 2021** • 59% of parents with adolescents aged 12-15 would allow them to be vaccinated (up 4% from May). • 74% of parents with adolescents aged 16-17 would allow them to be vaccinated. **May 2021** • 55% of parents or caregivers of adolescents aged 12-15 are likely to have them vaccinated, a 1% decrease from April.

		• The major reasons included wanting assurances for the safety in adolescents (59%), concern for long term effects in adolescents (50%), and wanting to wait to see if there were side effects (28%). **April-May 2021** • 56% of parents or caregivers of adolescents aged 12-15 will allow their adolescents to receive a vaccine. Parents who were willing to vaccinate themselves were more likely to vaccinate their adolescents compared to those who would not vaccinate themselves (85% vs 6%). • The top concerns among those who were unsure or unlikely to vaccinate their adolescents were a need for safety assurances (60%) and uncertainty about long-term effects (43%). **September 2020** • Pasifika and Indian parents were most likely to give a vaccine to their children (72% and 68%) and Māori and Other European were least likely (40% and 41%). **December 2020** • 40% of parents were willing to get their children vaccinated once approved, 33% were unlikely, and 24% were unsure. The least likely to vaccinate their children were Pasifika (39%) and Other Europeans (29%) followed by Māori (39%), NZ Europeans/Pakeha (41%), Asian (45%), and Indian (62%) parents.
Jeffs (2020) [86] Cross-sectional study New Zealand May 2020	Intention to vaccinate was investigated using an online survey in 1191 parents' and caregivers.	80%) of participants said they would vaccinate their child if a newly developed vaccine were available 80%) of participants said they would vaccinate their child if a newly developed vaccine were available • 69.6% of participants reported that they would vaccinate their child if a vaccine were available.

		• Participants with high fear scores were more uncertain about giving their children a COVID-19 vaccine, with only 56% (35/62) prepared to vaccinate compared to 71% (785/1110) of others with a lower fear score.
United Kingdom (n=4)		
Williams (2021) [67] preprint Qualitative study UK Jul 2021	Twenty-four individuals (7 parents) were qualitatively studied in both small groups and one-on-one semi structured interviews via videoconferencing to explore attitudes to getting children vaccinated for COVID-19.	• Participants expressed a full range of opinions regarding vaccination, acknowledging that it was a complex issue with risks and benefits to weigh. • Parents were not sure of the need for the vaccine for their children because of the perceived amount of risk, potential side effects, and unclear risk of transmitting. • Respondents also noted that familial and friend norms against vaccination as well as perceived opposition if vaccines were offered to children impacted their thoughts about vaccinating children. • Opinions regarding vaccination were tied to how respondents felt the pandemic had been managed the pandemic, often reflecting government distrust. • Conversely some respondents framed vaccinating children as a collective act rather than an individual act which was associated with not delaying vaccination, but this view was uncommon among parents. • Non-parents expressed positive views towards the COVID-19 vaccine where all seven parents expressed a level of hesitancy toward vaccinating general.
Office for National Statistics (2021) [7, 20, 49, 87, 88, 89] grey literature Longitudinal study UK Feb-Nov 2021	Parental acceptance of a COVID-19 vaccine for their children and adolescents was collected as part of the online Opinions and Lifestyle Survey. Feb-Mar: 17,201 responses pooled Mar-Apr: 16,362 responses pooled Oct 6-17, n = 150 Oct 20-31, n= 210 Nov 3-14, n = 150 Nov 18-28, n = 140	**November** • 58% of parents reported their 12-15 year olds have been vaccinated (up 30% from October), 24% were very likely to vaccinate (down 19%), 3% were fairly likely (down 4%), 4% were fairly unlikely (no change), and 8% were very unlikely (down 5%). • Male parents continue to be more likely to vaccinate their adolescents compared to female parents (34% vs 17%) but more women reported their adolescents have received a vaccine (65% vs 49%).

		October • 28% of parents reported their 12-15 year olds have been vaccinated (up 11% from earlier in October), 43% were very likely to vaccinate (down 7%), 7% were fairly likely (down 2%), 3% were neither unlikely or likely (up 1%), 4% were fairly unlikely (up 2%), 13% were very unlikely (up 2%), and 3% were unsure. • Male parents were more likely to report intention to vaccinate their adolescents compared to females (51% vs 36%). **March-April** • Vaccine hesitancy is highest among those with children aged 0-4 (12%) compared to 8% with children over 5 (8%), and among non-parents or those not living with dependent children (6%). Vaccine hesitancy has decreased since the last survey. • In those with children aged 0-4, vaccine hesitancy was more prevalent among women than men with children aged 0-4 (16% vs 8%). This has decreased since the last survey. • Positive vaccine sentiment is lowest among 0 to 4 (88%) compared to 92% with children over 5 and 94% among non-parents or those not living with dependent children **February-March** • The top reason for hesitancy was concern about side effects which was the same for both groups of parents.
Skirrow (2021) [15] preprint Mixed-methods study UK Aug-Oct 2020	An online survey and semi-structured interviews were conducted in a group of 1,181 pregnant women (aged 16+) to determine views on COVID-19 vaccine acceptability for themselves when pregnant, not pregnant, and for their babies.	• 81.2% of women reported that they would definitely accept or were leaning towards accepting a vaccine when not pregnant. Vaccine acceptance was significantly lower during pregnancy (62.1%, P<0.005) and for their babies (69.9%, p<0.005). • Compared to White ethnic women, ethnic minority women were twice as likely to reject a vaccine for themselves when not pregnant, pregnant and for their babies (P>0.005). • Those from lower-income households, aged < 25 years, and from some geographic regions

		were more likely to reject a vaccine when not pregnant, pregnant, and for their babies. • Women unvaccinated against pertussis in pregnancy were over four times more likely to reject a vaccine when not pregnant, pregnant and for their babies. • Thematic analysis revealed the most common reasons for hesitancy were vaccine safety, and a wider mistrust of vaccines in general.
Bell (2020) [8] Cross-sectional study England Apr-May 2020	The acceptability of a future vaccine was assessed in a group of 1252 parents and guardians (aged 16+ with a child <18 months old) using an online survey. Upon completion of the online survey, participants were asked if they were interested in taking part in a follow-up telephone interview. Nineteen individuals were included.	• Black, Asian, Chinese, Mixed or other ethnicity were almost 3 times more likely to reject a COVID-19 vaccine for themselves and their children compared to White British, White Irish, and White other participants. • 55.8% of respondents intend to vaccinate and 34.3% were unsure but leaning towards yes. • For vaccinating their children, 48.2% were willing to accept and 40.9% were unsure but leaning towards yes.
US (n=28)		
Centers for Disease Control and Prevention (2021) [26] grey literature Longitudinal study US Sep-Nov 2021	This interactive dashboard displays national vaccine coverage and intentions of parents of children and adolescents aged 5-17. The survey was conducted by telephone interview in Texas, Illinois, Pennsylvania, and New York. The number of people or number of parents in each survey was not reported. There were two collection periods: Sep 26-October 30 and October 31-November 27.	**November** • Of children aged 5-11, 8% had received one or more doses, 33.2% will definitely receive the vaccine, 34.3% probably will or were unsure, and 24.5% definitely will not receive the vaccine. • Of adolescents aged 12-17, 59.2% had received one or more doses, 7% will definitely receive the vaccine, 15.2% probably will or were unsure, and 18.6% definitely will not receive the vaccine. • The younger the child, the more parents were hesitant to vaccinate. • Hesitancy to vaccinate children and adolescents was associated with parents being male, living in a rural area, having lower income and education, identifying as Republican, having a history of not accepting other childhood vaccinations, and not being concerned about their child getting COVID-19. **September-October**

		• Of children aged 5-11, 44.4% will definitely receive the vaccine, 33.1% probably will or were unsure, and 22.2% definitely will not receive the vaccine. • Of adolescents aged 12-17, 58.1% had received one or more doses, 6% will definitely receive the vaccine, 16.3% probably will or were unsure, and 19.7% definitely will not receive the vaccine.
Centers for Disease Control and Prevention (2021) [36] grey literature Longitudinal study US Aug-Sep 2021	Parental intention to vaccinate adolescents aged 12-17 was assessed through the US Census Bureau's Household Pulse Survey (HPS). This reports on two collection periods (Aug 18-30 and Sept 1-13) which included 19,847 respondents.	• 63% reported at least 1 adolescent aged 12–17 in their household had received at least one dose of the vaccine, 7.1% of will definitely get their adolescents a vaccine, 13% would probably get or were unsure about getting their adolescents vaccinated, and 16.7% would not get their adolescents vaccinated. • 87% of parents who would not vaccinate themselves would also not vaccinate their adolescents. • The most common reasons for not vaccinating adolescents were concerns about side effects (62%), vaccine safety (36%), and lack of trust in the vaccine (32%) and government (29%). • Non-Hispanic Asian (86.1%) and Hispanic (66.7%) parents were more likely to vaccinate their adolescents compared to non-Hispanic White parents (61.6%). • Parental intention to vaccinate adolescents was associated with higher household income, higher education, and those with only 1 adolescent in the house.
Choi (2021) [63] Cross-sectional study US May-Jul 2021	Associations between parent vaccine confidence and intention to have their child with autism vaccinated against COVID-19 was assessed using an online survey of 322 parents with children aged 2-17 in Southern California.	• 49% of parents had received a vaccine and 35% intended to have their child with autism vaccinated if a vaccine was approved and recommended for children <12. • Stronger belief in vaccine benefits was associated with higher intentions to vaccinate a child with autism (OR 1.62, 95% CI: 1.21–2.15).
Rane (2021) [33] Cross-sectional study	Parental intention to vaccinate children and related sociodemographic factors was evaluated in a national sample of	• Parents who were vaccinated or intended to get vaccinated were more likely to have already vaccinated their eligible children/adolescent or intended to vaccinate

US Jun 2021	1162 parents with children and adolescents aged 2-17 using an online survey.	them when eligible, compared with vaccine-hesitant parents (64.9% vs 8.3% for children aged 2-4 years; 77.6% vs 12.1% for those aged 5-11 years; 81.3% vs 13.9% for those aged 12-15 years; and 86.4% vs 12.7% for those aged 16-17 years; all $P < 0.001$). • Among parents who were vaccinated or intended to get vaccinated, 10% would not immediately vaccinate their children and adolescents. • Concern about vaccine-related long-term adverse effects in children and adolescents was the most common reason for hesitancy. • Lower willingness to immediately vaccinate children and adolescents was seen in parents who were younger, Black, Hispanic, women, and those who did not have a college education. • Higher willingness to immediately vaccinate was seen in parents with a prior COVID-19 infection, who knew someone that died of COVID-19, were more worried about getting infected with COVID-19, and who have children that attended school in person.
Scherer (2021) [45] Cross-sectional study US Apr 2021	Using an internet panel of respondents in association with the Healthcare and Public Perceptions of Immunizations (HaPPI) Survey Collaborative, 985 adolescents (aged 13-17) and 1,022 parents of adolescents aged 12-17 were surveyed to determine acceptability of the COVID-19 vaccine prior to vaccine approval for this age group. Only results for parents were captured. Results for adolescents were captured in Table 2.	• Parents reported that adolescent specific safety (16.3%), efficacy (13.4%), and mandatory school vaccination (13.2%) information would increase their intentions to get vaccinated. • Parents who did not indicate a definite intention to vaccinate their adolescents would be more influenced if severity of COVID-19 increased for adolescents, if it would prevent spread to friends and family, would reduce community spread, and if it meant that the kids could resume social activities, go back to school, or travel again. • The most trusted sources of vaccine information were government agencies (CDC/FDA) followed by primary care physicians and state or local health officials.

		• 9.9% of parents would be influenced to get a vaccine for their adolescents if it were recommended by a health care professional. • The most trusted location for vaccination according to parents of unvaccinated children and adolescents were their doctors clinics (66.6%) followed by pharmacies (37.1%), a different doctors office (28.2%), or at schools with a parent present (26.1%). **16-17 year olds** • 27.6% of parents of 16-17 year olds reported their adolescents have received at least one dose. • Lower levels of parental vaccine acceptance for 16-17 year olds were found in parents who were female, Hispanic, and those with an education level lower than a Bachelor's degree. **12-17 year olds** • 55.5% of parents reported their 12-17 year olds will definitely or probably get vaccinated.
Naso (2021) [22] preprint Cross-sectional study US Apr 2021	While awaiting COVID-19 testing or vaccination in San Francisco the intention to vaccinate their children was assessed in 1,033 parents.	• 92% of parents intended to vaccinate their children and 57% want to do it as soon as it's available. • Major motivating factors for parents who intended to vaccinate spanned wanting to keep their child safe (92%), protecting the community (66%), protecting adults in their family (64%), and getting ahead of vaccination requirements for childcare/school (61%). • Reasons for vaccine hesitancy included possible immediate side effects (60%), possible long-term effects (41%), perceived potential impacts on future fertility (19%), and not believing their child was at risk for severe events (8%). • Vaccine hesitant parents had the greatest trust in their child's doctor (80.3%), followed by the Latino Task Force (51.7%), friends and family (50.0%), state government (49.2%), federal government (34.9%), newspaper, TV, or radio (32.8%), and social media (15.4%).

		• Multivariable analysis indicates that having younger children was associated with increased hesitancy. **0-4 year olds** • 90% (312/348) reported they will definitely or probably vaccinate their children. • 47% (144/304) of parents who intended to vaccinate want it as soon as it's available. **5-11 year olds** • 91% (461/506) of parents will definitely or probably vaccinate their children. • 53% (237/446) of parents who intended to vaccinate want it as soon as it's available. **12-15 year olds** • 93% (348/375) will definitely or probably vaccinate their adolescents. • 65% (220/336) of parents who intended to vaccinate want it as soon as possible. **16-17 year olds** • 97% (197/203) will definitely or probably vaccinate their adolescents. • 83% (158/190) of parents who intended to vaccinate want it as soon as possible.
Teasdale (2021) [24] Cross-sectional study US Mar-Apr 2021	An online survey of 1,119 parents or caregivers (18+) of children under the age of 12 in New York was conducted to determine vaccine intentions for their youngest child.	• 61.9% intend to vaccinate their youngest child (mean age 4.7 years), 23.3% were unsure, and 14.8% did not intend to vaccinate. • Intention to vaccinate increased when children were older and were White non-Hispanic and parents were between 30 and 44, male, and White non-Hispanic. In multivariate modelling only female parents (aPR 0.72, 95% CI: 0.61-0.85) and non-Hispanic Black parents (aPR: 0.79, 95%CI: 0.63-0.99) were associated with decreased intentions to vaccinate. • Parents were more likely to vaccinate if their child didn't have health insurance, if the child attended daycare more than once a week, had 2 children under 12, completed college or more, had a household income of $100,000, and were living in Manhattan.

		• In the adjusted model only having children attend daycare more than once a week was associated with increased intentions (aPR 1.23, 95% CI: 1.05-1.45). • Of the parents that plan on being vaccinated or had been vaccinated, 82.4% will vaccinate their child as compared to 25.4% of unsure parents and 4.5% among parents not planning on getting vaccinated ($p < 0.0001$). • Among vaccine hesitant parents, 81.2% cited safety and effectiveness as the main concerns. Hispanic (88.4%), non-Hispanic Black (85.1%) and Asian (82.3%) parents were more likely to report safety and effectiveness concerns compared to non-Hispanic white (607%) parents ($p = 0.01$) • Among vaccine hesitant parents, 21.7% believed children were at low risk for COVID-19 and don't need vaccination, and 6.6% and 9.5% reported medical and religious or philosophical reasons, respectively.
Teasdale (2021) [21] Cross-sectional study US Mar-Apr 2021	To evaluate parents (18+) intentions to vaccinate their children (aged 12 or under), an online survey of 2,074 adults across the US was conducted.	• 49.4% intend to vaccinate the youngest child in their household (median child age: 4.8 years, IQR: 4.5-5.1) when a pediatric vaccine is approved, 25.6% would not accept a vaccine for their child, and 25% were unsure. Parents were more likely to vaccinate children aged 7-12 (56.5%) compared to children aged 2-6 (48%) and <2 (37.2%). • Among parents who had received a vaccine or were intending to vaccinate, 85.2% would vaccinate their children. Of parents who were unsure about getting vaccinated themselves, 19.5% would vaccinate their children. Only 5.7% of parents who would not get vaccinated themselves reported planning to vaccinate their child ($p<0.0001$). • Reasons for vaccine hesitancy included potential safety or effectiveness concerns (78.2%), a belief that children did not need to be vaccinated (23%), medical reasons (11.2%), and religious reasons (8.5%). • Asian parents were more likely to report intentions to vaccinate their children

		compared to non-Hispanic Whites (aOR 1.38, 95% CI: 1.19-1.60). • Parents less likely to intend to vaccinate their children were female (aOR 0.69, 95% CI: 0.62-0.77), were less educated (aOR 0.73, 95% CI: 0.62-0.86) and had lower incomes (aOR 0.75, 95% CI: 0.64-0.88).
Wimberly (2021) [19] Cross-sectional study US Feb-Apr 2021	An online survey was conducted in 130 caregivers of childhood cancer survivors (diagnosed before the age of 18) across the US to evaluate intention to vaccinate themselves and their children.	• 21% of caregivers expressed hesitancy to vaccinate themselves and 29% expressed hesitancy to vaccinate their child who was a cancer survivor. • Of 97 caregivers who also had other children living in the household (with no cancer), 12% indicated their vaccination plan differed for these children compared to their child who survived cancer. • Willingness to accept a vaccine for their child who survived cancer was significantly associated with older age of the child (OR 1.15, 95% CI: 1.02–1.30, p=0.028), confidence in the federal (or 2.64, 95% CI: 1.21–5.74, p=0.011) and state (OR 1.94, 95% CI: 1.00–3.74, p=0.048) government's response to COVID-19, and reporting they obtained their COVID-19 information from cancer care professionals (or 7.88, 95% CI: 1.96-31.57, p=0.05). • Analysis of free-text responses revealed 3 themes: 1) expression of confidence in science, medicine, and vaccination as a strategy for health promotion, 2) confidence in vaccination and belief that childhood cancer survivors are at greater risk of COVID-19 complications compared to others, and 3) concerns about the quick development of the vaccine and insufficient safety/efficacy data in children and childhood cancer survivors.
Hill (2021) [34] Cross-sectional study US	Parents' intention to vaccinate their children against COVID-19 and factors associated with vaccine intention for children was assessed in 299 parents in Pennsylvania using online and telephone surveys.	• Most parents would definitely (46%) or probably (27%) accept a vaccine for their child. • Parental intention to vaccinate their children was significantly higher in parents who reported receiving the vaccine for themselves (aOR 62.8, 95% CI: 15.4-255.8) or parents who

Mar 2021		intend to get vaccinated themselves (aOR 72.1, 95% CI: 18.1-287.5). • Parents who received the influenza vaccine were significantly more likely to accept a COVID-19 vaccine for their child (aOR 4.8, 95% CI: 2.30-9.90). • Those who had their child vaccinated for influenza were significantly more likely to intend to accept a COVID-19 vaccine for their child (aOR 5.48, 95% CI: 2.50-12.0)
Szilagyi (2021) [23] Cross-sectional study US Feb-Mar 2021	In this national sample of 1,745 parents, the intentions to vaccinate 3759 children and adolescents was measured and reasons for vaccine hesitancy were explored.	• Parents were more likely to vaccinate their children and adolescents if they were between 11-18 years old (50.7%), compared to children who were aged 5-11 (45.9%), or 0-4 (39.2%). • 26% of parents wanted their children and adolescents vaccinated as soon as possible, 23% yes but they wanted to wait and see, 27% said no, 12% said no, but they would wait and see, and 13% are unsure. • Wanting to vaccinate as soon as possible was higher for children and adolescents aged 11-18 (30.0%) compared to children aged 5-10 (24.7%), or 0-4 (19.8%). • Having higher intentions to vaccinate children and adolescents was associated with parents having a Bachelor's degree or higher, being either Asian or Hispanic, having been vaccinated themselves already or being likely to get a vaccine, having received a flu vaccine in the past two years, and their children being older. • 41.5% of parents who were hesitant to vaccinate their children and adolescents strongly or somewhat agreed that they will do what their child's healthcare provider recommends compared to 94.7% of parents who intended to vaccinate their children and adolescents. • 27.1% of parents who were unlikely to have their children and adolescents vaccinated felt the vaccine would be important for their kid's health. • Parents who were unlikely to vaccinate their children and adolescents felt that the vaccine has not been around long enough (81.6%), were concerned about serious side effects

		(86.4%), and believed the vaccine might cause long lasting health problems (78.0%). • 88.1% of parents who were likely to vaccinate their children and adolescents completely trust their local public health department and 90.7% completely trust the government approval process for the vaccine. • The strongest predictor of being likely to vaccinate their children and adolescents was if the parents had received or intended to receive the vaccine (aRR 3.42, 95% CI: 2.32–5.04), those who trust social media (aRR 1.47, 95% CI: 1.10-1.95) and their child's doctor (aRR 1.40, 95% CI: 1.04-1.88), trust the governmental approval process for vaccine (aRR 1.30, 95% CI: 1.03-1.63), and if the child received a flu vaccine in the past two years (aRR 1.28, 95% CI: 1.11–1.48). • Factors associated with being less likely to vaccinate their children and adolescents including being Republican (aRR 0.81, 95% CI: 0.71-0.93), and having some college (aRR 0.81, 95% CI: 0.69–0.97) or a Bachelors degree (aRR 0.84, 95% CI: 0.72–0.99).
Czeisler (2021) [28] preprint Longitudinal study US Dec 2020-Mar 2021	An online survey was used to assess COVID-19 vaccine intentions and vaccine hesitancy among adults (18+) for themselves and their children across the US. The survey was answered by 5,188 adults in Dec 2020 and 5,256 adults in Mar 2021.	• In March, 66.0% would definitely or most likely obtain vaccine as soon as possible, 20% would decline, and 14% were undecided. In Dec, 63.7% were willing to vaccinate, 17.5% would decline, and 18.8% were undecided. • Intentions for children and booster vaccines were similar to personal vaccine intentions. Among 2160 of individuals living with or caring for children and adolescents aged 2-18 in the Mar survey, 60.4% would vaccinate those children and adolescents, 21.4% would decline, and 18.1% were undecided. • Of those who would vaccinate their children and adolescents, 93.5% would also vaccinate themselves. Of those who would not vaccinate their children and adolescents, 56.5% would also decline the vaccine for themselves. • Vaccine hesitancy was significantly more common among adults who were younger (aOR 3.88, 95% CI: 2.02-7.46), female (aOR 1.51, 95% CI: 1.16-1.96), Black (aOR 1.60, 95%

		CI: 1.10-2.33), very politically conservative (aOR 3.58, 95% CI: 2.16-5.94), less educated (aOR 3.43, 95% CI: 2.11-5.59), less frequent mask usage (aOR 3.92, 95% CI: 2.52-6.10), less adherent to social gathering avoidance (aOR 2.65, 95% 1.95-3.60), had more medical mistrust (aOR 2.11, 95% CI: 1.10-4.07), or had not received influenza vaccines in 2020 (aOR 4.11, 95% CI: 3.05-5.54).
McCabe (2021) [90] preprint Cross-sectional study US Dec 2020-Feb 2021	A national app distributed survey was conducted in 34,470 healthcare workers and adults from the general population to measure intent to receive a vaccine and factors associated with acceptance and refusal. Number of healthcare workers was not reported.	• Parents rather than non parents were more vaccine hesitant in multivariable analysis (aOR 1.24 95% CI: 1.13-1.36).
He (2021) [40] Cross-sectional study US Sep 2020-Feb 2021	To measure attitudes towards childhood vaccination and COVID-19 vaccine hesitancy, 242 parents of children and adolescents < 18 across the US were given an online mobile phone-based survey	• Childhood vaccine hesitancy scores (not specific to the COVID-19 vaccine) were higher during the COVID-19 than before the pandemic. • The main factor associated with decreased COVID-19 vaccine hesitancy was households with higher income (>100K). • Increased risk perception of the COVID-19 vaccine was associated with an increasing number of children in the household, African American or Hispanic respondents compared to White, and declining to state political identification while decreased risk scores were associated with having a Masters degree or post-graduate degree compared to high school graduate.
Teherani (2021) [46] Longitudinal study US	This study aimed to understand guardian intention to vaccinate their COVID-19 recovered child or adolescent (aged 2-15) before and after the press releases describing the phase 3 efficacy of the Moderna and Pfizer-BioNTech Phase 3 COVID-19 vaccines in adults. The first online survey was	• Of the 45 guardians who responded to both surveys, 53% guardians in the first and 46% in the second were willing to vaccinate their child/adolescent when available. In the first survey, 36% would refuse vaccination for their child/adolescent, and 31% from the second survey would refuse.

Apr-Nov 2020 & Dec 2020-Jan 2021	completed by 102 guardians in Georgia. Of this group, 45 completed the second online survey.	• The most common reasons for hesitancy included safety and side effect concerns and a lack of information. • Significantly more families would allow a vaccine to be given to their child if they had heard pro-vaccine reports compared to anti-vaccine or both types of reports (80% vs. 0% vs. 47%, p = 0.031). • Parents of children and adolescents who received an influenza vaccination within the last 2 seasons were more likely to say yes or maybe to a COVID-19 vaccine for their child/adolescent (21/29; 72%) compared to those who children and adolescents did not receive an influenza vaccine (9/14; 64%), p=0.58).
Roess (2021) [44] preprint Cross-sectional study US Dec 2020 – Jan 2021	Parental intention to vaccinate children and themselves were investigated in an online survey using a non-probability sample of 1,181 adults (18-64) who were parents or guardians.	• 69.3% of parents will vaccinate their children compared to 58.4% of parents who would be somewhat or likely to be vaccinate themselves. • Parental factors significantly associated with intending to vaccinate their children included being between the age of 50-64 (aOR 1.83, 95% CI: 1.05-3.21) and living in semi-urban areas (aOR 1.71, 95% CI: 1.11-2.65) compared to younger (18-29) and living in rural areas.
Ruggiero (2021) [51] Cross-sectional study US Nov 2020 -Jan 2021	To examine the attitudes, beliefs, and intention to vaccinate for COVID-19, 427 parents of children aged 1-8 across the US were surveyed online.	• 49.5% of parents want to vaccinate their child for COVID-19 and 44.17% want the vaccine as soon as one is available to them. • 21.93% of respondents demonstrated vaccine hesitancy for vaccinating their children. • 44% of parents have a positive attitude toward the COVID-19 vaccine. • 69.53% feel more hesitant about the COVID-19 vaccine compared to other childhood vaccinations. • The main reasons for parental hesitancy to vaccinate their children were side effects (61.50%) believing the vaccine to be unsafe (48.90%), and not believing that COVID-19 is dangerous to their child's health (7.30%). • Vaccination behaviours that were associated with a lower intention to vaccinate for COVID-19 included believing that as parent they should question vaccines (OR 0.44, 95% CI:

		0.27–0.71) and having an overall hesitancy about childhood vaccinations (OR 0.33, 95% CI: 0.14–0.78). • Beliefs associated with a lower intention to vaccinate included feeling it was better for children to receive fewer vaccines at the same time (OR 0.37, 95% CI: 0.22–0.61) and were worried about side effects (OR 0.27, 95% CI: 0.16–0.46). • Only trust in information about vaccines was significantly associated with a positive intention to get their child a COVID-19 vaccine (OR 6.12, 95% CI: 3.22-11.62).
Milan (2021) [27] Cross-sectional study US Dec 2020	To determine how maternal post-traumatic stress disorder (PTSD) and trauma history impact a mothers' beliefs and intentions to vaccinate themselves and their children, an online survey of 240 mothers across the US with a history of mental illness and children and adolescents between 3-18 was conducted.	• PTSD diagnosis history and total potentially traumatizing events (PTEs) were significantly positively correlated with all vaccine measures. • Mother and child/adolescent vaccine intentions were highly correlated with each other ($r = 0.90$, $p < 0.001$). • Among mothers with a PTSD history, 40% were vaccine hesitant compared to 23.9% of mothers without a PTSD history, X^2 ($df = 1$, $N = 238$) = 6.45, $P < 0.01$ and for their children and adolescents, 38.7% of mothers with a PTSD history were hesitant compared to 25.8% without a PTSD history, X^2 ($df = 2$, $N = 238$) = 4.08, $P < 0.05$. • The most common reasons for hesitancy included concern about side effects (31%) and a need for more information and observation (24%). • Differences in vaccine hesitancy were observed between those with and without previous PTSD diagnosis. Mothers with a PTSD history were less likely to mention believe in science and more likely to say their child/adolescent has specific health concerns. • Mothers indicated that the strongest influences to increase vaccine confidence would be personally reading about trials and research and recommendations from a pediatrician.

Catma (2021) [91] Cross-sectional study US Nov 2020	Parental perceptions towards a COVID-19 vaccine and willingness – to-pay (WTP) for a vaccine for themselves and their children and adolescents under 18 were evaluated using an online survey across the US.	• Parents were WTP $228-291 USD for a vaccine for themselves, and $243-321 USD for their children/adolescents. • Income was positively associated with adults' WTP for a vaccine for both themselves and their children/adolescents. • As the number of children/adolescents increased in a household, the WTP for child/adolescent vaccination increased. • 72% of parents believed that vaccines were important in preventing disease.
Haeder (2021) [92] Cross-sectional study US Oct-Nov 2020	Responses from 2,404 adults were collected from an online survey aimed to investigate attitudes toward vaccine mandates.	• Households with children were less supportive for vaccination mandates for daycare and university but not for kindergarten to grade 12. • Having children in the household was predictive of favourable attitudes towards COVID-19 mandates.
Marques (2021) [62] Cross-sectional study US Sep-Nov 2020	99 parents and caregivers (aged 24-63) of children were approached in person in dental treatment rooms to complete a survey regarding their intention to get their children vaccinated for COVID-19.	• 21.6% of parents say that they would allow their child to get vaccinated for COVID-19, 39.2% were unsure, and 42.3% would not allow their child to be vaccinated. • 19.6% of parents themselves say they will get vaccinated, 38.1% were not sure, and 42.3% would not get vaccinated. • 77.6% of parents reported the age of their children did not influence their decision to get a COVID-19 vaccine when available. • Intentions to vaccinate their child increased if they knew someone who had COVID-19 (OR 0.47, 95% CI: 0.24-0.93). • 40% of parents who got their child a flu vaccine every year would allow their child to be vaccinated for COVID-19. • 52.2% of parents would be influenced by a doctor recommendation for the COVID-19 vaccine compared to 42.4% who said no one would influence their decision.
Olagoke (2021) [18]	This study aimed to determine if there were overlapping factors related to parents' intention to	• Mean vaccination intention for COVID-19 was 3.19 ± 1.57 for themselves and 3.09 ± 1.55 for their children/adolescents. Mean HPV vaccine

Cross-sectional study US Sep-Oct 2020	vaccinate their child with the human papillomavirus (HPV) and COVID-19 vaccines. An online survey of 342 parents/guardians of at least one child or adolescent aged 11–17 years who have never been vaccinated against HPV and identified as Christians was conducted across the US. A 5-point Likert scale was used.	intention for their child/adolescent was 3.02 ± 1.32. • Bivariate analysis revealed that lower household income (< $75,000) was significantly associated with lower vaccination intention for COVID-19 for self (β 1.24, 95% CI: 0.91–1.57), child (β 1.23, 95% CI: 0.89– 1.56), and HPV for child (β 0.61, 95% CI: 0.31–0.91). • Parents who reported higher perceived vulnerability of their children and adolescents to HPV also reported significantly higher COVID-19 (β 0.32, 95% CI: 0.21–0.44) and HPV vaccination (β 0.38, 95% CI: 0.27–0.49) intentions for their child/adolescent in the multivariate linear regressions. • Perceived response efficacy to HPV vaccine was significantly associated with intention to receive the COVID-19 vaccine for self (β 0.46, 95% CI: 0.33–0.59), child (β 0.41, 95% CI: 0.28–0.53), and HPV vaccine for child (β 0.75, 95% CI: 0.64–0.85).
Rhodes (2021) [12] Cross-sectional study US Jul-Aug 2020	An online survey with open ended questions was used to measure vaccine hesitancy in 1381 vaccine hesitant parents (18+) with at least one child under 4 years of age across the US.	• Parents were slightly hesitant in their intentions to vaccinate their children (mean=3.55) and themselves (mean=3.58). • Those with a higher education level were more likely to accept a vaccine for both themselves and their children. • The most common source of vaccine information for parents were healthcare workers, personal research (online and traditional resources), personal beliefs and experience, and peer experts. • Open ended responses also indicate the influence non-traditional health sources such as naturopathic doctors and alternative medicine as well as sources such as forums, bloggers, personal intuition, and the experiences of friends or family.
Alfieri (2021) [41] Cross-sectional study	This online survey measured COVID-19 vaccine hesitancy for children in a sample of 1,425 parents from Illinois with children and adolescents <18.	• 33% of parents were hesitant to vaccinate their children and adolescents. • Parents were the most confident in government agencies (48%) and healthcare providers (44%) for COVID-19 information.

US Jun 2020		• In multivariate analysis, vaccine hesitancy was associated with being Non-Hispanic Black (aOR 1.75, 95% CI: 1.28–2.39) compared to Non-Hispanic Whites, making <$39,999 to $149,999 compared to those making >$150 K (<$39,999 aOR 2.86, 95% CI: 1.80 – 4.53, $40K-$79,999 aOR 2.59, 95% CI: 1.68 – 3.99, $80 K - $149,999 aOR 1.70, 95% CI: 1.09–2.64), and having public compared to private insurance (aOR 1.33, 95% CI: 1.01 – 1.75). • Factors associated with lower vaccine hesitancy included using the internet as a source of information (aOR 0.58, 95% CI: 0.46–0.74), using friends/family/word of mouth (aOR 0.69, 95% CI: 0.53-0.88), and healthcare providers (aOR 0.64, 95% CI: 0.48-0.86) compared to those that did not use each of these sources.
Davis (2020) [38] preprint Cross-sectional study US Jun 2020	Factors associated with 1008 parents' likelihood to vaccinate themselves and their children against COVID-19 was investigated using an online survey.	• Compared to Hispanic, non-Hispanic White and Black parents; parents who identified as Other were more likely to vaccinate. • 63% of parents reported they were likely to vaccinate their children against COVID-19 and 60% were likely to get a vaccine themselves. • Factors significantly associated with likelihood to vaccinate their children and themselves include older age, male gender, being married, and higher education and income levels.
Walker (2021) [50] Qualitative study US Mar-May 2020	Twenty-five mothers from the Midwest were interviewed by telephone using the Health Belief Model and vaccine hesitancy frameworks to understand intention to vaccinate and perceptions of COVID-19 as a threat for their 15-26 year old adolescents.	• 16% of parents would immediately accept a vaccine for their adolescents or for themselves, 16% would reject, 40% would delay, and 28% were unsure. • Barriers were not wanting to gamble with a new vaccine, wanting to know the efficacy of the vaccine, wanting time to decide, and confusion over COVID-19 information/disinformation. • Most hesitant mothers felt COVID-19 was a serious threat, however mothers who did not accept any childhood vaccines or hesitantly accepted the HPV vaccines did not view COVID-19 as a threat.

Kelly (2021) [14] Cross-sectional study US Apr 2020	In this online survey, 2279 adults were selected through address-based sampling and were asked to report their willingness to vaccinate their children and beliefs about the pandemic.	• 73% would be willing to vaccinate their children compared to 75% willing to get a vaccine for themselves. • Variables significantly associated with an increased likeliness to vaccinate their child included being male parent compared to female parent, being of Hispanic origin compared to not having Hispanic origins, having received the flu vaccine in the past year, disagreed to fully agreed that they are worried about getting COVID-19 compared to those who strongly disagreed, and perceived COVID-19 as a moderate to very high threat compared to those who reported the threat as low/very low. • Lower intention to vaccinate children was significantly associated with being younger, having less education, and being Black.
Thunstrom (2021) [16] Randomized controlled trial US Mar 2020	3133 adults participated in an online survey regarding their intentions to vaccinate themselves and their children for COVID-19. Participants were randomized into eight information treatment groups. Each group involved specific messaging in which the probability of infection, the conditional mortality rate from COVID-19, and whether the different health authorities in the US provide consistent risk information varied.	• 19.5% of participants would not vaccinate themselves. • Of the 1156 participants with children, 19.7% would not vaccinate their children.
Global (n=5)		
Lazarus (2021) [31] preprint Cross-sectional study 23 countries: Brazil, Canada, China, Ecuador,	Vaccine acceptance rates and factors influencing acceptance of a COVID-19 vaccine was analyzed using various methods (online, telephone, and direct mail surveys) of 22,500 adults across 23 countries (n=1000 per country).	• Parents' willingness to vaccinate children was highest in China (95%), Brazil (91.3%), Ecuador (85.9%), Peru (85.1%) and lowest in Russia (35.5%), Poland (46.3%) and France (48.5%). In Canada it was 66.9%. In all countries, willingness to vaccinate one's children was significantly higher among parents who accepted the vaccine for themselves ($p<0.001$).

France, Germany, Ghana, India, Italy, Kenya, Mexico, Nigeria, Peru, Poland, Russia, South Africa, South Korea, Singapore, Spain, Sweden, Turkey, UK, US Jun 2021		
Goldman (2021) [93] Cross-sectional study Canada, Israel, US Dec 2020 – Mar 2021	An online survey was conducted to assess the correlation between willingness to vaccinate children <12 years old and vaccination rate. Of the 797 surveys, 441 were from Canada (Vancouver, Saskatoon, Edmonton, Calgary), 112 from the US (Denver, Los Angeles, Dallas, Seattle, Atlanta), and 167 from Israel.	• In Canada (vaccination was mostly limited to first dose during the study), willingness to vaccinate children < 12 was trending downward (correlation = -0.28), whereas in the United States, it was trending upwards (correlation = 0.21). In Israel, the initial trend was a increasing, but declined shortly thereafter (correlation = 0.06). • For every 5% increase in population vaccination rate (by single dose), willingness to vaccinate children decreased in Canada (aOR 0.96, 95% CI: 0.91-1.01, p=0.12), and increased in the US (aOR 1.04, 95% CI: 1.00-1.09, p=0.08), and Israel (aOR 1.01, 95% CI: 0.99-1.02, p=0.49).
Skjefte (2021) [48] Cross-sectional study 16 countries: Australia, Africa, Argentina, Brazil, Chile, Colombia, India, Italy, Mexico, New Zealand, Peru, Philippines, Russia, Spain, UK, US	An online survey was used to evaluate the acceptance of COVID-19 vaccination among 5,294 pregnant women and 12,562 mothers of children and adolescents younger than 18-years-old.	• 69.2% of all women intended to vaccinate their children and adolescents. Acceptance levels were above 85% in India, Mexico, Brazil and Colombia and below 52% for the US, Australia, and Russia. • For mothers, the most common reasons to decline a vaccine were concern that approval of the vaccine will be rushed for political reasons (39.8%), lack of safety and effectiveness data among children (32.7%), and worry about safety and side effects (28.4%). • A recommendation from a healthcare provider had a limited impact on intention. 45.9% of pregnant women and 54.6% of non-pregnant women would be more likely to have

Oct-Nov 2020		themselves/children vaccinated if recommended by health care providers.
Goldman (2020) [94] Cross-sectional study 6 countries: Canada, Israel, Japan, Spain, Switzerland, and US Mar-Jun 2020	Factors associated with parents' willingness to enroll their children in a COVID-19 vaccine trial were analyzed using an online survey of 2768 parents.	• 18.4% of participants reported they would enroll their child in a clinical trial for a COVID-19 vaccine and 14.4% would agree to a randomized placebo-controlled study. • The most significant factor associated with parents' willingness for their child to participate was the parental willingness to participate in a vaccine trial themselves (OR 32.9, 95% CI: 21.9–51.2). • Other factors include having an older child (OR 1.0, 95% CI: 1.0–1.01), having children who received all current vaccinations (OR 2.67, 95% CI: 1.35–5.71), and parents with high school education or lower (OR 1.79, 95% CI: 1.18–2.74). • Mothers were less likely to enroll their child in a trial (OR 0.68, 95% CI: 0.47–0.97).
Goldman (2020) [95] Cross-sectional study 6 countries: Canada, Israel, Japan, Spain, Switzerland, and US Mar-Jun 2020	This online survey of 2557 caregivers (18+) presenting with their children for emergency care during COVID-19 pandemic aimed to assess their willingness to accept an accelerated regulatory process for the development of vaccines against COVID-19.	• 43.1% of caregivers reported that they were willing to accept less rigorous testing and post research approval of a new COVID-19 vaccine and 56.9% believe that standard vaccine regulations should not be changed for COVID-19 vaccines. • Mothers were less likely than fathers to approve of changes to the vaccine development process (OR 0.641, 95% CI: 0.529-0.775, P<0.01). • Factors associated with caregivers' willingness to accept expedited COVID-19 vaccine research included having children who were up to date on their vaccines (OR 1.72, 95% CI: 1.29-2.31, P<0.001), a willingness to have their children vaccinated against COVID-19 if a vaccine became available (OR 1.84, 95% CI: 1.54-2.21, P<0.001), and worry that the caregivers themselves had COVID-19 infection (OR 1.1, 95% CI 1.05-1.16, P<0.001).
aPR = adjusted prevalence ratio, aRR = adjusted risk ratio, CI = confidence interval, HCW = healthcare worker, OR = odds ratio		

Table 2: Evidence of adolescent acceptance of COVID-19 vaccine for themselves (n=7)

Study	Methods & survey tools	Key KAB outcomes
UK (n=3)		
Office for National Statistics (2021)[57 87 88] grey literature Longitudinal study UK May-Sep 2021	Adolescent (age 16-17) acceptance of a COVID-19 vaccine for themselves was collected as part of the online Opinions and Lifestyle Survey. May–June, n=16,180 (350 aged 16-17) June-July, n=15,430 (270 aged 16-17) September, n = 2,480 (130 aged 16-17)	**September** • 51% have not received a vaccine, 44% have had one dose, and 4% have had two doses. • 75% were likely to get a second dose, 12% were neither likely nor unlikely, and 9% would prefer not to say. • 42% of previously vaccine hesitant 16-18 year olds were unlikely to get the vaccine and 55% were unsure about getting vaccinated. • 58% who had at least one dose were encouraged to get the vaccine because it would protect themselves, 56% to protect others, 39% by talking to friends and family about having the vaccine. • 64% got vaccinated because they wanted restrictions to ease and life to get back to normal. • Among vaccine incentives, vaccine hesitant adolescents who had at least one dose of the vaccine reported being motivated by walk in vaccination with no appointment (50%), getting the vaccine close to where they worked (25%), free travel to vaccine centers (8%), free tickets to events (4%), and 40% reported none of the options encouraged them to get vaccinated. • Among unvaccinated adolescents, 50% reported that no vaccine incentives would increase their likelihood of getting vaccinated. However, some reported that vouchers or discounts (36%) or walk-in appointments (22%) would incentivize them to receive a vaccine. • 18% of vaccine hesitant adolescents were worried about their ability to have children in the future. **June-July** • 12% reported they have received a vaccine (up 5% from May/June), 4% have been offered a vaccine and were waiting to be vaccinated (up

		2%), 73% would very likely accept a vaccine if offered (down 4%), 6% were unsure or preferred not to say (no change), don't know, prefer not to say, and 5% were unlikely to get a vaccine if offered (down 2%). **May–June** • 7% reported they have received a vaccine, 2% have been offered a vaccine and were waiting to be vaccinated, 77% would very likely accept a vaccine if offered, 6% were unsure or preferred not to say, and 7% were unlikely to get a vaccine if offered.
Office for National Statistics (2021) [60] grey literature Qualitative study UK Jun 2021	Seventeen 16-29 year olds who had reported vaccine hesitancy in the Opinions and Lifestyle Survey were interviewed online or by telephone to understand the factors driving their vaccine hesitancy. Only results for adolescents <18 are captured.	• Adolescents < 18 years old were more reliant on social media for vaccine information and were more likely to cite conspiracy theories as a reason for being hesitant.
Fisher (2021) [98] Qualitative study UK Jun 2020	The experiences of 21 adolescents (12-17 years) were captured through semi-structured interviews, either through a digital platform or by telephone.	• 100% of the sample were willing to be vaccinated once a vaccine was available. • Most adolescents were motivated by an altruistic desire to protect others compared to themselves. However some felt that the vaccine should be prioritized for population groups at greater risk. • Some adolescents recognized the availability of a vaccine could help with a return "back to normal".
US (n=4)		
Rogers (2021) [58] Cross-sectional study US Jun 2021	Attitudes towards the COVID-19 vaccine were recorded directly from 916 adolescents aged 12-17 during a period of time when the vaccine was approved for their age group.	• 25.9% reported they had already been vaccinated, 24.5% would receive the vaccine, 26.4% were unsure, and 23.1% would not get the vaccine. • The top concerns in this age group were that the vaccine was not tested enough and worry about the side effects.

		• In general, adolescents did not believe that COVID-19 is mild, that their age group was not at risk, or that natural immunity is better. • Adolescents who already had the vaccine or intended to vaccinate were older, had higher household incomes, parents with more education, more COVID-19 anxiety, fewer doubts about the necessity of the vaccine, lower levels of safety or efficacy concerns, and higher agreement with friend and parental norms than kids who would not get vaccinated. Asian American and Latinx adolescents had higher intentions to be vaccinated compared to White adolescents. • Parental norms, friend norms, safety concerns, necessity concerns, COVID-19 anxiety, parent education, household income, and age were all highly correlated. Friend norms directly influence willingness to be vaccinated and indirectly influenced the necessity of the vaccine. • In mediation analysis, parental norms directly influenced vaccine intention and indirectly influenced safety and efficacy concerns in addition to the perceived necessity of the vaccine.
Willis (2021) [59] Cross-sectional study US May 2021	Vaccine hesitancy among 345 adolescents (12-15 year olds) in Northwest Arkansas was assessed using an online survey.	• 42% reported they are not hesitant at all about getting the vaccine, 22% were a little hesitant, 21% were somewhat hesitant, and 15% were very hesitant. • Hours of TV watched on a school day was the only significant variable positively associated with vaccine hesitancy ($r_s(199) = 0.140$, $p = 0.048$).
Budhwani (2021) [61] Qualitative study US May 2021	Face-to-face, qualitative in-depth interviews were conducted with 28 African American or black adolescents aged 15-17 in rural Alabama to evaluate sentiment towards COVID-19 vaccination.	• Three vaccine related themes were identified: 1) influence of community leaders and older family members, 2) fear of side effects, and 3) misinformation and institutional distrust. • The likelihood of accepting a vaccine was influenced by older family and community members' vaccine related behaviors and sentiments. • Misinformation (obtained from peers and online) and fear of side effects were intertwined.

		• Many expressed skepticism toward the government and healthcare systems.
Scherer (2021) [45] Cross-sectional study US Apr 2021	Using an internet panel of respondents in association with the Healthcare and Public Perceptions of Immunizations (HaPPI) Survey Collaborative, 985 adolescents (aged 13-17) and 1,022 parents of adolescents aged 12-17 were surveyed to determine acceptability of the COVID-19 vaccine prior to vaccine approval for this age group. Only results for parents were captured. Results for parents were captured in Table 1.	• 26.1% of adolescents aged 16-17 reported they had received ≥1 COVID-19 vaccine dose. 51.7% of unvaccinated adolescents aged 13-17 reported they would definitely or probably receive the vaccine. • The main factors that would increase vaccination intentions in adolescents were more information about child/adolescent specific safety (21.7%), efficacy (17.6%), and mandatory school vaccination requirements (23.9%). These were similar in parents. • The most trusted sources of vaccine information for adolescents were government agencies (CDC/FDA) followed by primary care physicians and state or local health officials. • 8.9% of adolescents would be influenced to get a vaccine if it were recommended by a health care professional (slightly lower than parents at 9.9%). • The most trusted location for vaccination according to unvaccinated adolescents were their doctors clinics (76.5%) followed by pharmacies (39.9%), a different doctors office (25.3%), or at schools with a parent present (30.2%).

Table 3: Systematic reviews of parental acceptance of a COVID-19 vaccine for their children (n=1)

Study	Methods & survey tools	Key KAB outcomes
Galainis (2021) [2] preprint Systematic review Global Aug 2021	This systematic review encompassed 17 studies that evaluated parents' willingness to vaccinate their children and adolescents (<18) against COVID-19. The search was conducted on August 11, 2021 and there were no country or date restrictions.	• Parents' willingness to vaccinate their children and adolescents ranged from 29-72.7%. • The overall proportion of parents that intend to vaccinate their children and adolescents was 56.8% (95% CI: 51.8-61.8%). • A subgroup analysis showed the proportion of parents that intend to vaccinate their children and adolescents in North America was 55.2% (95% CI: 45.6-64.7%, I^2 =98.8), in Asia was 54.1% (95% CI: 39.8%-68.3%, I^2 =99.5%), and in Europe was 53.2% (95% CI: 44.6%-62.2%, I^2 =97.3%).

		• Parental intention to vaccinate their children and adolescents was positively associated with male gender, older age of parents and children, higher socioeconomic status, white race, positive attitudes toward vaccination, higher levels of knowledge, recent history of influenza vaccination, and higher levels of perceived threat from the COVID-19

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