



Rapid Review: What is known about parents' considerations for vaccine uptake for children and adolescents?

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The authors declare they have no conflicts of interest to report.

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Executive Summary

Background

As coronavirus disease 2019 (COVID-19) vaccines continue to become available, and age eligibility expands, the public health sector is tasked with ensuring vaccination is available and that uptake is high across the eligible population. An in-depth understanding of parents' considerations in vaccinating their children is important for designing effective and equitable campaigns at the local level to promote COVID-19 vaccination among children and adolescents.

This rapid review was produced to support public health decision makers' response to the COVID-19 pandemic. This review seeks to identify, appraise, and summarize emerging research evidence to support evidence-informed decision making.

This rapid review includes evidence available up to May 31, 2021 to answer the question: **What is known about parents' considerations for vaccine uptake for children and adolescents?**

Key Points

- Trust, or lack of trust, in health care providers or government, was a factor in parental decisions about childhood vaccination. Parents who accept vaccination for their children tend to express trust in health care professionals, science, and government. Some parents believe that advice from physicians is biased and not trustworthy, and look to other or additional sources for information. A lack of trust in science, or doubt that vaccines are effective, also emerged as a reason not to vaccinate, or to be hesitant or unsure. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.
- Safety was a common theme across studies exploring perceptions of childhood vaccines. Parents who support vaccination for their children expressed confidence that vaccines are generally safe. Concern about adverse effects was a common finding. Some parents who are hesitant or refuse vaccination have a general sense that vaccines are unsafe, along with a sense that there are too many childhood vaccines, that the ingredients may not be safe, or that vaccination can cause illness. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest.
- Information provided has an effect on decisions about vaccination. A theme that parents lack information emerged from the research, but there is also a theme that there is too much information that is contradictory, or that it is delivered without time to consider it. Parents want access to their desired amount of trusted information; however, the appropriate amounts and preferred sources vary across individuals. A strategy to tailor the amount and nature of information to the parent, based on checking in about their wish to know more, seems most likely to be successful. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest. Citizen representative input emphasizes clear, concise information prior to vaccination about what to expect at a vaccination appointment, including practical strategies for managing and reporting adverse reactions if any arise.

- In their decision-making, parents assess risks associated both with disease and with vaccination. For example, if the risks associated with the disease are high (e.g., the likelihood or consequences of being affected is high) and the risks associated with vaccination are low (e.g., the vaccine is considered safe), the risk calculation may predispose parental choice to vaccinate. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest. Citizen representative comments suggest that providing information about risks of disease is important but must be carefully done to avoid being perceived by parents as overly fear-based.
- Some parents feel strongly about the right and the opportunity to do their own research and make their own choices about the health of their children without influence or input from authorities. Some parents express a preference for perceived alternative methods of building a healthy immune system in their children, through healthy diet and ways of living, through alternative health care approaches, and through perceived beneficial exposure to disease. The confidence in this finding is moderate (GRADE-CERQual) and it is likely that this finding is a reasonable representation of the phenomenon of interest. The citizen representative on this review suggested that parental uptake could be supported by providing accessible information and flexible options about where, by whom and when to vaccinate their children. The potential for herd immunity as a protective factor, and as a rationale for not vaccinating one's own children, was raised by the citizen representative, although this theme did not emerge strongly in the research literature. More research on interpretations and applications of information about herd immunity is needed.
- The studies included in this review provide only very limited evidence for the experiences of populations who live with social and structural inequities. Studies examining experiences of high and low socioeconomic status (SES) populations found that largely similar decision-making processes are used, although high SES parents expressed more mistrust of physicians, and low SES parents had less familiarity with vaccines and experienced more structural barriers to accessing vaccination for their children. Further research is required to ensure representation of these populations for decision making.

Overview of Evidence and Knowledge Gaps

- Most evidence to date comes from studies that are focused on vaccines other than COVID-19. Given the unprecedented nature of the COVID-19 pandemic, it is not known how applicable these findings are to the current context.
- Parents who had a negative vaccination experience themselves, or with their child, sometimes expressed concerns about vaccination for their children. Previous experience with a vaccine-preventable disease was identified as a factor that led to more vaccine acceptance. Citizen representative comments reflected the importance of health care provider acknowledgement, not dismissal, of these negative experiences.
- Some populations, including people living with low income, described access barriers (e.g., transportation, clinic policies that require certain conditions to be met, cost of vaccination) that limited their uptake of vaccines.
- Social norms and judgements of others were reported to influence both uptake and refusal, depending on the nature of the social environment.

- One moderate quality review focused specifically on perceptions of mandatory vaccinations for children. Requiring vaccination, penalizing parents who choose not to vaccinate by keeping children out of school, or providing financial incentives to vaccinate were considered inappropriate strategies. Universal strategies were preferred over targeted approaches. The risk of unvaccinated children spreading disease was acknowledged by parents as part of a rationale in favour of mandatory vaccination, although this was not considered to be a definitive reason to require vaccination.
- Two studies explored reasons for acceptability of a COVID-19 vaccine (one among pregnant women, for their babies, and one in November 2020 before a vaccine was available). Parents who were accepting of a COVID-19 vaccine for their infants or children emphasized protection of the child and other family members, a desire to return to normal activities, and trust and belief in the vaccine. Parents who were unsure or opposed to COVID-19 vaccine for their infants or children emphasized vaccine safety concerns, the belief that children are at low risk of infection or harm, the need for transparent information, and a mistrust of science and health care providers.
- Studies related to parental acceptance of specific vaccines (influenza vaccine (two studies) and infant pneumococcal vaccine (one study) found that parents generally had confidence in vaccines for their children, and had concerns about the number of vaccinations their children received. They trusted information from what they considered reliable, unbiased sources, although the perception of what constituted a reliable source differed across individuals.
- Gaps in research evidence were noted by the citizen representative. The experiences and decision-making processes among parents of a child with chronic illness or disability are not well represented in the research. Not enough is known about the effect of access factors, such as a trusted provider and public health or school-based clinics focusing on vaccination. What appears to be lack of trust in health care providers may be related to lack of consistent access to providers, and the lack of opportunity to build a trusting relationship.
- Information about vaccination needs to be perceived as unbiased and trustworthy by the parent. Health care professionals are an important source of information, but not all parents consider health care providers to be trusted sources about vaccination. Parents want an opportunity to give informed consent or to not consent, based on their own assessments of the risks.
- Steps to ensure that vaccines are accessible to those who wish to receive them can involve providing transportation and convenient options, removing financial barriers, and providing as much information about risks and benefits as is requested.

Methods

Research Question

What is known about parents' considerations for vaccine uptake for children and adolescents?

Search

On May 31, 2021, the following databases were searched using key terms:

- [MEDLINE](#) database
- [EMBASE](#) database
- [Sociological Abstracts](#)
- [CINAHL](#)
- [Trip Medical Database](#)
- World Health Organization's [Global literature on coronavirus disease](#)
- [COVID-19 Evidence Alerts](#) from McMaster PLUS™
- [COVID-19 Living Overview of the Evidence \(L·OVE\)](#)
- [McMaster Health Forum](#)
- [Cochrane Rapid Reviews](#)
- [Prospero Registry of Systematic Reviews](#)
- [MedRxiv preprint server](#)
- NCCMT [COVID-19 Rapid Evidence Reviews](#)
- [NCCDH](#)
- [NCCEH](#)
- [NCCHPP](#)
- [NCCID](#)
- [NCCIH](#)
- [Institute national d'excellence en santé et en services sociaux \(INESSS\)](#)
- [BC Centre for Disease Control \(BCCDC\)](#)
- [Public Health England](#)

A copy of the full search strategy is available in Appendix 1 [at this link](#).

Study Selection Criteria

The search results were first screened for recent guidelines and syntheses. Findings from syntheses are presented first, as these take into account the available body of evidence and, therefore, can be applied more broadly to populations and settings.

English- and French-language, peer-reviewed sources and sources published ahead-of-print before peer review were included. Surveillance sources were excluded.

	Inclusion Criteria	Exclusion Criteria
Population	Parents of infants, children and adolescents Primary guardians and caretakers of infants, children and adolescents	Studies that report on considerations for parental vaccine uptake from the perspective of others (e.g., health care providers, administrators, etc.) Studies of vaccination uptake for self, among pregnant women
Interest	Vaccination for children and adolescents Studies that explore considerations for vaccine uptake from the perspective of parents; could include qualitative or mixed methods studies	HPV vaccines; Studies that report on non-modifiable 'risk factors' for low uptake of vaccine, such as sociodemographic variables collected through administrative data or cross-sectional surveys.

Data Extraction and Synthesis

Data relevant to the research question, such as study design, setting, location, population characteristics and key findings were extracted when reported. We synthesized the results narratively due to the variation in methodology and research questions for the included studies.

Appraisal of Evidence Quality

We evaluated the quality of included evidence using critical appraisal tools as indicated by the study design below. Quality assessment was completed by one reviewer and verified by a second reviewer. Conflicts were resolved through discussion.

Study Design	Critical Appraisal Tool
Synthesis	Assessing the Methodological Quality of Systematic Reviews (AMSTAR) AMSTAR 1 Tool
Qualitative	Critical Appraisal Skills Programme (CASP) Checklist for Qualitative Research
Mixed Method	Mixed Methods Appraisal Tool (MMAT)

Completed quality assessments for each included study are available on request.

The Grading of Recommendations, Assessment, Development and Evaluations - Confidence in Evidence from Reviews of Qualitative Research ([GRADE CERQual](#)) (Lewin et al., 2015) approach was used to assess the confidence in the findings in qualitative research based on four key domains:

- Methodological limitations
- Relevance
- Coherence
- Adequacy

The overall confidence in the evidence (expressed as either high, moderate, low, or very low) for each prominent theme was determined considering the characteristics of the available evidence. A judgement of 'overall confidence is moderate' means that it is likely that the finding is a reasonable representation of the phenomenon of interest.

Findings

Summary of Qualitative Findings

This document includes nine completed syntheses, three in-progress syntheses and 27 single studies for a total of 39 publications included in this review.

Question: What is known about parents' considerations for vaccine uptake for children and adolescents?

	Inclusion Criteria
Population	Parents, primary guardians and caretakers of infants, children and adolescents
Interest	Considerations for uptake of vaccination for children and adolescents

Key Finding (Consideration for parents)	Number of studies contributing to this finding		GRADE-CERQual assessment of confidence in the evidence	Explanation of GRADE-CERQual assessment
	Study design	n		
Trust, or lack of trust, in health care providers or government	Syntheses	8	Moderate confidence	Minor concerns regarding methodological limitations, relevance
	Single	7		
Perceived safety of vaccines	Syntheses	6	Moderate confidence	Minor concerns regarding methodological limitations, relevance
	Single	7		
Satisfaction with amount and sources of information about vaccination	Syntheses	6	Moderate confidence	Minor concerns regarding methodological limitations, relevance
	Single	8		
Risk assessment of disease versus vaccination	Syntheses	4	Moderate confidence	Minor concerns regarding methodological limitations, relevance
	Single	7		
Parental choice and preference for alternative health approaches	Syntheses	6	Moderate confidence	Minor concerns regarding methodological limitations, relevance
	Single	13		

*In the GRADE-CERQual approach to quality of evidence, all review findings start off by default as 'high confidence' and are then 'rated down' by one or more levels (for example, from high to moderate confidence) if there are concerns regarding any of the CERQual components: (1) methodological limitations, (2) coherence, (3) adequacy of data and (4) relevance. This starting point of 'high confidence' reflects a view that each review finding should be seen as a reasonable representation of the phenomenon of interest unless there are factors that would weaken this assumption.

Warning

Given the need to make emerging COVID-19 evidence quickly available, many emerging studies have not been peer reviewed. As such, we advise caution when using and interpreting the evidence included in this rapid review. We have provided a summary of overall certainty of the evidence to support the process of decision making. Where possible, make decisions using the highest quality evidence available.

Table 1: Syntheses

Reference	Date Released	Description of Included Studies	Summary of Findings	Quality Rating: Synthesis	Quality Rating: Included Studies
General Childhood Vaccination					
Smith, L. E., Hodson, A., & Rubin, G. J. (2021). Parental attitudes towards mandatory vaccination: a systematic review . <i>PREPRINT</i> .	Feb 26, 2021 (Search completed Sep 17, 2020)	This review included 17 studies exploring parental beliefs and attitudes about mandatory vaccination, including 5 qualitative studies	Seven themes were identified in the qualitative studies: (1) Infringement of parental rights (2) Universal schemes seen as more equitable compared to targeted approaches (3) Financial incentives and requiring vaccination for child-care/schooling were seen as inappropriate (4) Motivation for vaccination <ul style="list-style-type: none"> • Protection from illness • State incentives (5) Disproportionate impact <ul style="list-style-type: none"> • Low-income families are more reliant on financial incentives to vaccinate (6) Objection to penalizing parents by withholding school or financial benefits if they chose not to vaccinate due to safety concerns (7) Risk of unvaccinated children passing on illness	Moderate <i>PREPRINT</i>	4 high 1 low
Rosso, A., Massimi, A., Pitini, E., Nardi, A., Baccolini, V., Marzuillo, C., ... Villari, P. (2020). Factors affecting the vaccination choices of pregnant women for their children: a systematic review of the literature . <i>Human Vaccines & Immunotherapeutics</i> 16(8). 1969-1980.	Aug 2, 2020 (Search completed Aug 2019)	This narrative review included 16 studies exploring the knowledge and attitudes of pregnant women towards pediatric vaccinations and their choices to vaccinate. <ul style="list-style-type: none"> • 12 Cross-sectional • 2 RCT • 1 Longitudinal • 1 Qualitative 	Overall understanding of the importance of vaccination was generally high. However, participants also felt they did not have enough information, were concerned about side effects and lacked trust in healthcare professionals. The majority of studies found the internet and media to be the most common sources of vaccine information. Intention to vaccinate varied depending on the infectious disease in question	Moderate	14 moderate 2 low

<p>Majid, U. & Ahmad, M. (2020). The factors that promote vaccine hesitancy, rejection, or delay in parents. <i>Qualitative Health Research</i> 30(11). 1762-1776.</p>	<p>Jun 29, 2020 (Search completed Jun 23, 2019)</p>	<p>This interpretive review included 32 studies exploring the factors influencing parental vaccine hesitancy, rejection and delay</p> <ul style="list-style-type: none"> • 32 Qualitative 	<p>Seven factors were identified:</p> <ol style="list-style-type: none"> (1) Parents with previous negative experiences believed vaccines were unsafe and dangerous, and feared side effects of the vaccine (2) Vaccine hesitant parents valued natural treatments and lifestyles. (3) Parents preferred to interact with others who shared their same views on vaccines (4) Parents felt their concerns on the risk of vaccines were overlooked (5) Vaccine hesitant parents believed information from physicians was biased and relied on information from alternative health providers, whereas parents who vaccinated their children were more open to information from physicians. Both vaccine accepting and vaccine hesitant parents felt there was too much information on vaccination and were not sure which sources they could trust (6) Vaccine hesitant parents expressed a distrust in the health system (7) Mandatory vaccine policies were not seen as necessary by vaccine-accepting parents. Parents expressed anger and frustration when fear was used as a strategy to increase vaccination rates 	<p>Low</p>	<p>Not done</p>
<p>Diaz Crescitelli, M. E., Ghirotto, L., Sisson, H., Sarli, L., Artioli, G., Bassi, M. C., ... Hayter, M. (2020). A meta-synthesis study of the key elements involved in childhood vaccine hesitancy. <i>Public Health</i> 180. 38-45.</p>	<p>Dec 12, 2019 (Search date not specified)</p>	<p>This review included 27 studies of parents who were hesitant about vaccinating their child</p> <ul style="list-style-type: none"> • 22 Qualitative • 5 Mixed methods 	<p>Five main themes emerged.</p> <ol style="list-style-type: none"> 1. Risk Conceptualization <ul style="list-style-type: none"> • Risk of the vaccine causing harm • Low perceived risk from the disease 2. Mistrust <ul style="list-style-type: none"> • Government • Health care professionals • Vaccine information 	<p>Moderate</p>	<p>12 High 5 Moderate to high 9 Moderate 1 Low to Moderate</p>

			<ol style="list-style-type: none"> 3. Alternative health beliefs <ul style="list-style-type: none"> • Vaccine is an unnatural approach to immunity • Too many vaccines at once 4. Philosophical view on parental responsibility 5. Parent's information <ul style="list-style-type: none"> • Lack of objective information on vaccines and side effects; Unbalanced and biased information 		
Gidengil, C., Chen, C., Parker, A. M., Nowak, S., & Matthews, L. (2019). Beliefs around childhood vaccines in the United States: A systematic review . <i>Vaccine</i> 37(45). 6793-6802.	Sep 24, 2019 (Search completed Nov 2017)	<p>This review included 71 studies exploring beliefs about childhood vaccines. Participants were largely parents who were both vaccine accepting and vaccine hesitant.</p> <ul style="list-style-type: none"> • 71 Qualitative 	<p>Seven themes emerged:</p> <ol style="list-style-type: none"> (1) Participants believed that vaccines could cause illnesses (2) Participants expressed mistrust in physicians, pharmaceutical companies and/or the government (3) Vaccines were perceived as unnecessary and natural immunity was preferable (4) Vaccines were believed to protect children (5) Participants were skeptical about the effectiveness of vaccines and the validity of herd immunity (6) Decisions around vaccination is the right of the parent (7) Participants expressed morality concerns around vaccines derived from aborted fetal tissue 	Low	Not done
Dubé, E., Gagnon, D., MacDonald, N., Bocquier, A., Peretti-Watel, P., & Verger, P. (2018). Underlying factors impacting vaccine hesitancy in high income countries: a review of qualitative studies . <i>Expert Review of Vaccines</i> 17(11). 989-1004.	Nov 7, 2018 (Search completed Dec 22, 2017)	<p>This review of 22 studies explored the influences on parental vaccine decisions</p> <ul style="list-style-type: none"> • 22 Qualitative 	<p>This review used the socio-ecological model to identify the following themes:</p> <p>Individual level</p> <ul style="list-style-type: none"> • Vaccine safety • Anticipated regret and feelings of responsibility • Knowledge and sources of information on vaccination • Risks associated with or without vaccination 	Low	20 high 2 low

			<ul style="list-style-type: none"> • Personal experiences with vaccine preventable diseases <p>Interpersonal level</p> <ul style="list-style-type: none"> • Social norms and judgement <p>Community level</p> <ul style="list-style-type: none"> • Trust in mainstream, complementary and alternative medicine and the pharmaceutical industry 		
Forster, A. S., Rockliffe, L., Chorley, A. J., Marlow, L. A., Bedford, H., Smith, S. G., & Waller, J. (2016). A qualitative systematic review of factors influencing parents' vaccination decision-making in the United Kingdom . <i>SSM – Population Health</i> 2. 603-612.	Dec 2, 2016 (Search completed Dec 2, 2014)	<p>This review of 34 studies explored the factors influencing parental decisions to vaccinate a child</p> <ul style="list-style-type: none"> • 34 Qualitative 	<p>Two types of decision-making were found to be used by parents. These two approaches were not mutually exclusive. Parents were found to adopt both approaches at different times.</p> <p>(1) Non-deliberative decision making where parents were happy to comply, did not think they had a choice and/or relied on social norms to make decisions</p> <p>(2) Deliberative decisions where parents weighed the risks and benefits, used the experiences of others to inform their decisions, considered judgment from others and their emotions (fear of side effects, worry and guilt) to guide their decisions to vaccinate</p> <p>Trust in vaccine information and stakeholders informed both non-deliberate and deliberate decisions</p> <p>For parents who decided to vaccinate, practical issues such as time and travel to appointments was a barrier</p>	Low	4 high 30 low
White, T., Sevdalis, N., Willaby, H., King, C., & Leask, J. (2014). Systematic Review into Factors Underlying Parental Decisions about Childhood Vaccinations. Copy obtained from author.	Oct 3, 2014 (Search completed Oct 2013)	<p>This review of 72 studies explored factors influencing parental decisions to vaccinate a child</p> <ul style="list-style-type: none"> • 62 Qualitative • 10 Mixed methods 	<p>Parents and caregivers made decisions based on many related factors. Most factors cited were emotional or cognitive rather than practical barriers, such as access to vaccines</p>	Moderate	45 high 20 moderate 8 low

			<p>The most frequently cited motivators for vaccination included trust in healthcare provider and vaccine safety, likelihood and prevalence of vaccine-preventable diseases and social norms for vaccination</p> <p>The most frequently cited barriers to vaccination included beliefs in adverse effects or doubts around safety, unmet needs for information from health professionals, and belief in natural immunity or lack of direct threat from vaccine-preventable diseases</p>		
<p>Mills, E., Jadad, A. R., Ross, C., & Wilson, K. (2005). Systematic review of qualitative studies exploring parental beliefs and attitudes toward childhood vaccination identifies common barriers to vaccination. <i>Journal of Clinical Epidemiology</i> 58(11). 1081-8.</p>	<p>Nov 1, 2005 (Search completed May 2003)</p>	<p>This review of 15 studies explored parental barriers to childhood vaccination.</p> <ul style="list-style-type: none"> • 15 qualitative 	<p>Most of the participants were mothers. Four main themes emerged</p> <ol style="list-style-type: none"> (1) Issues of harm <ul style="list-style-type: none"> • Adverse effects • Pain with vaccination (2) Distrust <ul style="list-style-type: none"> • Medical community • The necessity of vaccines (3) Access <ul style="list-style-type: none"> • Parents believed children should not be vaccinated when they had a minor illness • Parents were unaware of the vaccine schedule (4) Other <ul style="list-style-type: none"> • Parents believed they could control the pathogens their child may be exposed to • Moral or religious reasons 	<p>Moderate</p>	<p>2 high 12 moderate 1 low</p>

Table 2: In-progress Syntheses

Title	Anticipated Release Date	Comments	Description of Document
<p>Duzgun, M.V. & Isler Dalgic, A. (2020). Interventions for Prevent Parental Vaccine Refusal and Vaccine Hesitancy: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. <i>PROSPERO, CRD42020157785</i></p>	<p>Jun 30, 2020</p>	<p>No update available as of June 11, 2021</p>	<p>This systematic review and meta-analysis will quantify the effectiveness of interventions to prevent parental vaccine refusal/vaccine hesitancy and explore the best interventions to increase vaccine acceptance</p>
<p>Han, K., Larson, H., Chantler, T., & liu, M. (2021). A systematic review of vaccination against influenza and Covid - 19 among preschool children and migrants. <i>PROSPERO, CRD42021244809</i></p>	<p>Dec 31, 2021</p>		<p>This systematic review will summarize parental factors that predict influenza vaccine uptake among preschool children and personal factors that predict influenza and COVID-19 vaccine uptake among migrants</p>
<p>Obohjemu, K., Floor, C., & Ling, J. (2021). Parental childhood vaccine hesitancy in the UK: a systematic review protocol. <i>PROSPERO, CRD42021233539</i></p>	<p>Feb 15, 2022</p>		<p>This systematic review will report the overall prevalence of childhood vaccine hesitancy among parents in the United Kingdom (UK). The review will also explore associations between sociodemographic characteristics of parents and childhood vaccine hesitancy, factors responsible for vaccine hesitancy, sources of vaccine information, vaccine specific hesitancy and predictors of vaccine uptake among parents</p>

Table 3: Single Studies

Reference	Date Released	Study Design	Participants	Setting	Summary of findings	Quality Rating:
COVID-19 Vaccines						
Skirrow, H., Barnett, S., Bell, S., Riaposova, L., Mounier-Jack, S., Kampmann, B., & Holder, B. (2021). Women's views on accepting COVID-19 vaccination during and after pregnancy, and for their babies: A multi-methods study in the UK. PREPRINT.	May 3, 2021	Qualitative	n=233 pregnant women (open-text survey) n=10 pregnant women (interview participants)	United Kingdom	This study explored reasons related to acceptance of childhood COVID-19 vaccines for their babies among pregnant women, though open-ended survey questions and interviews. Factors influencing acceptance of COVID-19 vaccines for infants included: <ul style="list-style-type: none"> • Safety concerns related to speed of vaccine development and lack of evidence on effects • Trust or mistrust in vaccines and health system • Belief that children are low-risk carriers 	Moderate Preprint
Bell, S., Clarke, R., Mounier-Jack, S., Walker, J. L., & Paterson, P. (2020). Parents' and guardians' views on the acceptability of a future COVID-19 vaccine: A multi-methods study in England. Vaccine 38(49). 7789-7798.	Nov 17, 2020	Qualitative	n=1049 parents or guardians (open-ended survey) n=19 parents or guardians (interview participants)	England	Among parents/guardians, reasons reported through open-ended survey questions and interviews for COVID-19 vaccine acceptance for their child/children included: <ul style="list-style-type: none"> • Protection of the child and other family members • Desire to return to normalcy • Trust and belief in the vaccine <p>Among parents/guardians who were leaning towards or completely opposed to the COVID-19 vaccine for their child/children, reported reasons included:</p> <ul style="list-style-type: none"> • Vaccine safety and effectiveness concerns • Perception of children being at low risk • Previous COVID-19 infection • Need for transparent information on vaccine development, efficacy, and safety to make informed decisions • Mistrust in science, medical profession 	Moderate

Influenza Vaccines						
Paterson, P., Chantler, T., & Larson, H. J. (2018). Reasons for non-vaccination: Parental vaccine hesitancy and the childhood influenza vaccination school pilot programme in England . <i>Vaccine 36</i> (36). 5397-5401.	Aug 28, 2018	Qualitative	n=25 parents who chose not to vaccinate their child against influenza	England	<p>This study explored, through interviews, reasons why parents chose not to vaccinate their child against influenza. Reasons included:</p> <ul style="list-style-type: none"> • No perceived need for vaccine due to child being low risk and healthy • Concerns about vaccine effectiveness and safety (side effects) • Concerns about vaccine ingredients, specifically porcine gelatin (due to religious reasons) <p>Reported factors among parents which would address vaccine hesitancy:</p> <ul style="list-style-type: none"> • Presence of an epidemic among children • If friends or family were high-risk • More evidence on vaccine effectiveness among children 	High
Herbert, N. L., Gargano, L. M., Painter, J. E., Sales, J. M., Morfaw, C., Murray, D., ... Hughes, J. M. (2013). Understanding reasons for participating in a school-based influenza vaccination program and decision-making dynamics among adolescents and parents . <i>Health Education Research 28</i> (4). 663-72.	May 30, 2013	Qualitative	n=31 parents	Rural Georgia, United States	<p>This study used focus groups to explore attitudes and decision-making processes among parents who participated in or chose not to participate in a school-based influenza clinic for their child</p> <p>Among parents who decided not to participate, reasons included:</p> <ul style="list-style-type: none"> • Skepticism about the experimental nature of the school-based program • Desire to take children to pharmacy or primary care physician instead • Concerns about vaccine safety and side effects • Personal negative experiences with receiving the vaccine <p>Barriers to influenza vaccination:</p> <ul style="list-style-type: none"> • Inconvenient locations; transportation • Parental time off work to take child to receive vaccine 	Moderate

					<p>Factors that could encourage school-based vaccination:</p> <ul style="list-style-type: none"> • Relationship/trust-building with parents in the community • Use of different communication channels for awareness raising/education <p>Use of informational brochures influenced decision-making among participating and non-participating parents differently.</p> <ul style="list-style-type: none"> • For participating parents, brochures allayed concerns • For non-participating parents, brochures provided information overload 	
Infant Pneumococcal Vaccine						
Chantler, T., Newton, S., Lees, A., Diggle, L., Mayon-White, R., Pollard, A. J., & Fitzpatrick, R. (2006). Parental views on the introduction of an infant pneumococcal vaccine . <i>Community Practitioner</i> 79(7). 213-6.	Jul 2006	Qualitative	n=38; parents of children <2 years old	England	<p>From Oct – Nov 2002, 23 interviewees and 2 focus groups were asked about their attitudes towards infant immunization, how they felt about the introduction of the new pneumococcal vaccine and what support they would need to have confidence in the vaccine. The following themes emerged:</p> <ul style="list-style-type: none"> • Overall confidence and belief in immunizations • Anxiety about immunization; the number of vaccines children receive or making the wrong decision • Trust and understanding of information from reliable sources • Response to a new immunization; perceived risk and perceived benefit 	Moderate

General Childhood Vaccinations						
Nurmi, J. & Harman, B. (2021). Why do parents refuse childhood vaccination? Reasons reported in Finland. <i>Scandinavian Journal of Public Health</i> . Epub ahead of print.	Apr 12, 2021	Qualitative	n=38 parents who refused vaccination for their children	Finland	Among Finnish parents who were interviewed, reasons for partial or complete refusal of vaccinations for their children included: <ul style="list-style-type: none"> • Risks and side effects of vaccinations • Distrust of health officials, medical professionals, and the pharmaceutical industry • Belief that natural immunity or alternative therapies provide better protection against communicable diseases 	Moderate
Ten Kate, J., Koster, W., & Van der Waal, J. (2021). "Following Your Gut" or "Questioning the Scientific Evidence": Understanding Vaccine Skepticism among More-Educated Dutch Parents. <i>Journal of Health and Social Behavior</i> 62(1). 85-99.	Feb 3, 2021	Qualitative	n=31 parents who hesitate or refused to vaccinate their children	Netherlands	This study used interviews to investigate reasons for vaccine hesitancy or full refusal among parents with post-secondary education including: <ul style="list-style-type: none"> • Desire to be critical thinkers and not simply follow government recommendations • Uncertainty about reliability of vaccine evidence • Belief in the benefits of natural immunity or a natural approach to health care • Lack of scientific rigor in vaccination studies 	High
Wiley, K. E., Leask, J., Attwell, K., Helps, C., Degeling, C., Ward, P., & Carter, S. M. (2020). Parenting and the vaccine refusal process: A new explanation of the relationship between lifestyle and vaccination trajectories. <i>Social Science & Medicine</i> 263. 113259.	Aug 5, 2020	Qualitative	n=21; parents of children >18 years old who refused vaccination	Australia	Parental refusal of childhood vaccines was explored through in-depth interviews with vaccine-declining caregivers. <ul style="list-style-type: none"> • All parents identified parental responsibility as a reason for non-vaccination • Attitudes and opinions fluctuate as a result of changing personal experience and risk assessment • Vaccine declining parents do not necessarily embrace all aspects of an alternative lifestyle; many 'mainstream' parents make alternative lifestyle choices with respect to vaccination 	Moderate

<p>Swaney, S. E. & Burns, S. (2019). Exploring reasons for vaccine-hesitancy among higher-SES parents in Perth, Western Australia. <i>Health Promotion Journal of Australia</i> 30(2). 143-152.</p>	<p>Aug 9, 2018</p>	<p>Qualitative</p>	<p>n=18; high SES vaccine-hesitant parents >\$125,000 (n=11)</p> <p>health care professionals (n=7)</p>	<p>Australia</p>	<p>Qualitative interviews were conducted with vaccine hesitant, high socio-economic parents and health care providers who provided clinical services, to identify parent perceptions and influences on vaccination. Four main themes were identified among parents:</p> <ul style="list-style-type: none"> • Parents believed their higher education levels led to enhanced decision-making processes • Parents had high feelings of control over individual health and believed that individual choices would control for vaccine preventable diseases • Perceived risk of diseases was low, but perceived risk of negative effects from vaccines was high • Parents expressed a need for more information on vaccine ingredients and necessity of vaccination 	<p>High</p>
<p>Romijnders, K., van Seventer, S. L., Scheltema, M., van Osch, L., de Vries, H., & Mollema, L. (2019). A deliberate choice? Exploring factors related to informed decision-making about childhood vaccination among acceptors, refusers, and partial acceptors. <i>Vaccine</i> 37(37). 5637-5644.</p>	<p>Aug 2, 2019</p>	<p>Qualitative</p>	<p>n=55; vaccine acceptors (n=9) refusers (n=12) partial acceptors (n=24)</p>	<p>The Netherlands</p>	<p>12 semi-structured focus groups were conducted to explore differences related to decision-making of childhood vaccine acceptors, refusers and partial acceptors. The following observations were identified:</p> <ul style="list-style-type: none"> • acceptors view vaccines as a given • refusers based their decision on anecdotal, rather than evidence-based information and perceived risk from vaccines higher than diseases • partial acceptors extensively debated the pros and cons of each individual vaccine and perceived risk from vaccines as higher than diseases 	<p>Moderate</p>
<p>Helps, C., Leask, J., Barclay, L., & Carter, S. (2019). Understanding non-vaccinating parents' views to inform and improve clinical encounters: a qualitative study in an Australian community. <i>BMJ Open</i> 9(5). e026299.</p>	<p>May 28, 2019</p>	<p>Qualitative</p>	<p>n=32; non-vaccinating parents</p>	<p>Australia</p>	<p>Qualitative interviews with parents were conducted to understand the decision-making process to forego vaccination and their encounters with the healthcare system. Themes include:</p> <ul style="list-style-type: none"> • potential harm of Western medicine and lifestyle • experience(s) introducing doubt 	<p>Moderate</p>

					<ul style="list-style-type: none"> • valid consent; vaccination through coercive measures • being dismissed by health care professions over observation of adverse events following vaccination • encounters with health professionals; health care providers as listeners and source of information rather than guardians of health • quest for “real truth”; information comes from multiple sources, not just healthcare providers • reluctance to system inflexibilities; being told what to do • ongoing risk assessment <p>Participants in the study did not report having an unwavering intention not to vaccinate prior to becoming parents. Rather, all had personal experiences that led to their decision</p>	
Mendel-Van Alstyne, J. A., Nowak, G. J., & Aikin, A. L. (2018). What is 'confidence' and what could affect it?: A qualitative study of mothers who are hesitant about vaccines . <i>Vaccine</i> 36(44). 6464-6472.	Oct 22, 2018	Qualitative	n=61; vaccine hesitant mothers with children ≤ 5 years of age	Philadelphia, PA (n=4) San Francisco/Oakland, CA (n=4)	<p>8 two-hour focus groups were conducted between two socio-economic diverse groups (>\$75K, <\$75K) to examine the concept of confidence in relation to childhood vaccines</p> <p>Reasons for lack of confidence in childhood vaccines similar among high socio-economic (HSES) and low socio-economic (LSES) mothers:</p> <ul style="list-style-type: none"> • not having enough time to learn, do research and make a decision • lack of information • concerns over children’s immune system • development of autism, asthma or allergies • not perceived to be safe • beliefs that vaccines cause the illness (e.g., flu) • vaccine ingredients 	Moderate

					<ul style="list-style-type: none"> • lack of control over number of, scheduling and use of combination vaccines • effectiveness <p>HSES mothers cited the age at which vaccinations are given/small size of infants and toddlers as well as a general mistrust of physician and healthcare provider motives or financial incentives to encourage vaccination</p> <p>LSES mothers cited unfamiliarity and a lack of personal experience with the vaccine</p> <p>Reasons for having higher confidence on childhood vaccines similar among HSES and LSES mothers include:</p> <ul style="list-style-type: none"> • familiarity/personal experience (e.g., they received as kids) • recommendation/information comes from a trusted source • satisfied that they have done their research <p>HSES mothers cited additional reasons for higher confidence including their relationship with their healthcare provider and their healthcare provider's willingness to have their own children receive the vaccine. LSES mothers cited personal experience with vaccine preventable diseases as a contributing factor to confidence in vaccines</p>	
Ward, P. R., Attwell, K., Meyer, S. B., Rokkas, P., & Leask, J. (2017). Understanding the perceived logic of care by vaccine-hesitant and vaccine-refusing parents: A qualitative study in Australia . <i>PLoS One</i> 12(10). e0185955.	Oct 12, 2017	Qualitative	n=29 vaccine-hesitant parents	Australia	<p>Interviews were conducted with parents to focus on the perceived risks and benefits incurred by vaccinating (or not vaccinating) their children</p> <p>The main themes were:</p> <ul style="list-style-type: none"> • their decision not to vaccinate as a logical, reasoned choice 	High

					<ul style="list-style-type: none"> • their knowledge of evidence and recommendations, leading to distrust and rejection of Western medical epistemology <p>their participation in labour-intensive parenting practices which they saw as boosting the natural immunity of their children and protecting them from illness (reducing or negating the perceived need for vaccinations)</p>	
Carrion, M. L. (2018). An ounce of prevention: Identifying cues to (in)action for maternal vaccine refusal . <i>Qualitative Health Research</i> 28(14). 2183-2194.	Aug 10, 2018	Qualitative	n=50; mothers who refused one or more childhood vaccine	North America	<p>Qualitative interviews were conducted with mothers to explore the events, experiences and information that prompted initial skepticism towards vaccines. Three themes emerged:</p> <ul style="list-style-type: none"> • Perceived adverse events • Endorsements from healthcare professionals; physicians expressing even minor doubts to criticizing vaccine schedules • Perceived contradictions in expert communication 	Moderate
Carrion, M. L. (2018). "You need to do your research": Vaccines, contestable science, and maternal epistemology . <i>Public Understanding of Science</i> 27(3). 310-324.	Aug 25, 2017	Qualitative	n=50; mothers who refused one or more childhood vaccine with children <2 years old	North America	<p>Qualitative interviews were conducted with mothers to explore how participants' arguments and explanations for vaccine refusal straddled the boundary between personal and technical knowledge claims. The following themes emerged:</p> <ul style="list-style-type: none"> • Mothers accept science, yet view existing vaccine conclusions as unsubstantiated or flawed. They felt scientific research reflects a political or economic agenda and lacks objectivity • Mothers do not accept traditional scientific approaches as absolute truth and consider maternal instinct superior to science 	Moderate

<p>Koski, K., & Holst, J. (2017). Exploring vaccine hesitancy through an artist-scientist collaboration: Visualizing vaccine-critical parents' health beliefs. <i>Journal of Bioethical Inquiry</i> 14(3). 411-426.</p>	<p>Aug 16, 2017</p>	<p>Qualitative</p>	<p>n=9 vaccine-hesitant parents</p>	<p>The Netherlands and Finland</p>	<p>Interviews were conducted to explore health beliefs. These beliefs were interpreted through arts-based diagrams that merged multiple aspects of the parents' narratives, and then used in a collaborative meaning-making dialogue between the artist and the scientist. Four main health beliefs originated from the parents' interviews:</p> <ul style="list-style-type: none"> • perceived benefits of illness, • belief in the body's intelligence and self-healing capacity, • beliefs about the "inside–outside" flow of substances in the body, • view of death as a natural part of life 	<p>Moderate</p>
<p>Blaisdell, L. L., Gutheil, C., Hootsmans, N. A., & Han, P. K. (2016). Unknown risks: parental hesitation about vaccination. <i>Medical Decision Making</i> 36(4). 479-89.</p>	<p>Oct 27, 2015</p>	<p>Qualitative</p>	<p>n=42 vaccine-hesitant and refusing parents</p>	<p>United States</p>	<p>Focus group interviews were conducted to elicit parents' perceptions and thought processes regarding the risks associated with vaccination and non-vaccination, the sources of these perceptions, and their approach to decision making about vaccination for their children.</p> <ul style="list-style-type: none"> • Parents tended to perceive risks of vaccination as greater than the risks of vaccine-preventable diseases. • Parents perceived ambiguity in information about the harms of vaccination, citing concerns about the missing, conflicting, changing, or otherwise unreliable nature of information 	<p>Moderate</p>
<p>Gross, K., Hartmann, K., Zemp, E., & Merten, S. (2015). 'I know it has worked for millions of years': the role of the 'natural' in parental reasoning against child immunization in a qualitative study in Switzerland. <i>BMC Public Health</i> 15. 373.</p>	<p>Apr 12, 2015</p>	<p>Qualitative</p>	<p>n=32 parents who decided not to fully immunize their children</p>	<p>Switzerland</p>	<p>Interviews were conducted to explore parents' perceptions of immunization.</p> <ul style="list-style-type: none"> • Parents believed in the strength of the naturally acquired immune system. • Childhood diseases were not perceived as a threat but as part of the natural way to reinforce the body and to acquire a "natural" and strong immunity • Parents considered immunization as an artificial intrusion into the natural 	<p>High</p>

					development of the immune system and feared overloading the still immature immune system of their young children and infants through current vaccination schedules	
Harmsen, I. A., Mollema, L., Ruiters, R. A., Paulussen, T. G., de Melker, H. E., & Kok, G. (2013). Why parents refuse childhood vaccination: a qualitative study using online focus groups . <i>BMC Public Health</i> 13. 1183.	Dec 16, 2013	Qualitative	N=60 parents who refused all or some vaccinations for their children	The Netherlands	In a series of 8 online focus groups with parents, reasons for vaccine refusal were explored Themes emerged related to: <ul style="list-style-type: none"> • family lifestyle that promotes their children's health, and therefore reduces the risk of getting an infectious disease • perceptions about the child's body and immune system being insufficiently developed • perceived risks of disease, vaccine efficacy, and side effects • perceived advantages of experiencing the disease • prior negative experience with vaccination • social environment; • gaps in knowledge and information provided • perception that too many vaccines are required or recommended 	Moderate
Glanz, J.M., Wagner, N.M., Narwaney, K.J., Shoup, J.A., McClure, D.L., McCormick, E.V., & Daley, M.F. (2013). A mixed methods study of parental vaccine decision making and parent-provider trust . <i>Academic Pediatrics</i> 13(5). 481-8.	Sep 1, 2013	Mixed methods	n=24 parents of under-vaccinated children under 4 years	United States	As part of a mixed methods study, focus groups were conducted to explore decision-making related to vaccines. Themes included: <ul style="list-style-type: none"> • the vaccine decision-making process begins prenatally • vaccine decision making is an evolving process • there is overall trust in the pediatrician but a lack of trust in the information they provided about vaccines 	High

<p>Whyte, M. D., Whyte Iv, J., Cormier, E., & Eccles, D. W. (2011). Factors influencing parental decision making when parents choose to deviate from the standard pediatric immunization schedule. <i>Journal of Community Health Nursing</i> 28(4). 204-14.</p>	<p>Nov 4, 2011</p>	<p>Qualitative</p>	<p>N=143 parents who had refused vaccination for at least one child, and who participated in organizations skeptical about immunization practices</p>	<p>United States</p>	<p>Parents completed an open-ended survey about their decision not to participate in the recommended vaccination schedule</p> <ul style="list-style-type: none"> Parents described a variety of misperceptions regarding the risks represented by common pediatric immunizations, including the perceived risk of autism, the presence of toxic ingredients in vaccines, and the desire to avoid ADHD 	<p>Moderate</p>
<p>Tickner, S., Leman, P. J., & Woodcock, A. (2010). Parents' views about pre-school immunization: an interview study in southern England. <i>Child: Care, Health and Development</i> 36(2). 190-7.</p>	<p>Feb 3, 2010</p>	<p>Qualitative</p>	<p>n=21 parents</p>	<p>England</p>	<p>Interviews with parents were conducted to explore parents' views about immunization and to identify possible reasons for lower second dose pre-school uptake</p> <p>Although most parents believed pre-school immunization to be important and most intended to immunize, a minority questioned whether it was necessary based on their understanding of the duration of protection provided by the primary course</p> <p>Compared with primary immunization, parents typically received no information about pre-school doses prior to their invitation to attend and had little or no contact with healthcare professionals. Other barriers included minor illness, apprehension about taking an older child for vaccinations and work or childcare commitments</p>	<p>Moderate</p>

<p>Gullion, J. S., Henry, L., & Gullion, G. (2008). Deciding to opt out of childhood vaccination mandates. <i>Public Health Nursing</i> 25(5). 401-8.</p>	<p>Aug 21, 2008</p>	<p>Qualitative</p>	<p>N=25 parents who chose not to vaccinate their children</p>	<p>United States</p>	<p>Interviews explored the attitudes and beliefs of parents who consciously chose not to vaccinate their children and the ways in which these parents process information on the pros and cons of vaccines</p> <p>Two themes emerged:</p> <ul style="list-style-type: none"> • a desire to have information on vaccines • trust issues with the medical community <p>Although parents placed a high value on scientific knowledge, they also expressed distrust of the medical community</p>	<p>Moderate</p>
<p>Niederhauser, V. P. & Markowitz, M. (2007). Barriers to immunizations: Multiethnic parents of under- and unimmunized children speak. <i>Journal of the American Academy of Nurse Practitioners</i> 19(1). 15-23.</p>	<p>Jan 5, 2007</p>	<p>Qualitative</p>	<p>n=64 parents or foster parents of under-immunized two-year olds</p>	<p>Hawaii, United States</p>	<p>Focus groups were held with predominantly Asian, Hawaiian or White parents/foster parents recruited from Head Start and other family support programs to explore the barriers to immunizations in parents whose children were not fully immunized by age 2</p> <p>Five core themes emerged as barriers to childhood immunizations:</p> <ul style="list-style-type: none"> • parental barriers including personal situations of parents such as drug use or inconvenience, mistrust of sources of information, lack of knowledge about immunization, and fear that children could catch diseases from immunization) • transportation barriers to accessing clinics • financial barriers to affording vaccination • child issues, such as delays in vaccination due to child illness, health organization issues such as lack of reminders or clinic policies that create barriers 	<p>High</p>

<p>Tarrant, M., & Gregory, D. (2003). Exploring childhood immunization uptake with First Nations mothers in north-western Ontario, Canada. <i>Journal of Advanced Nursing</i>, 41(1), 63-72.</p> <p>Tarrant, M., & Gregory, D. (2001). Mothers' perceptions of childhood immunizations in First Nations communities of the Sioux lookout zone. <i>Canadian Journal of Public Health</i>, 92(1), 42-45.</p>	Jan 2003	Qualitative	n=28 mothers, 2 First Nations communities	Sioux Lookout Zone, north-western Ontario, Canada	<p>Qualitative interviews were conducted with First Nation mothers to explore beliefs and perceptions of childhood immunizations and vaccine-preventable diseases</p> <p>Participants were motivated to seek immunizations for their children by a fear of vaccine preventable diseases</p> <ul style="list-style-type: none"> • A small proportion of mothers questioned the effectiveness of vaccines in preventing disease • Traumatic immunization experiences, vaccine side-effects and sequelae, negative interactions with health professionals, knowledge gaps related to vaccine effectiveness, the influence of others who are against vaccines, and barriers such as time constraints and not being able to vaccinate during a clinic visit when the child was ill all served as deterrents to immunization 	High
<p>Kulig, J. C., Meyer, C. J., Hill, S. A., Handley, C. E., Lichtenberger, S. M., & Myck, S. L. (2002). Refusals and delay of immunization within southwest Alberta. Understanding alternative beliefs and religious perspectives. <i>Canadian Journal of Public Health</i> 93(2). 109-12.</p>	Mar 1, 2002	Qualitative	n=47 people of Dutch ethnic background, Hutterites, and alternative health proponents, who chose not to vaccinate or delayed immunization for their children.	Alberta	<p>Interviews explored reasons for not vaccinating with members of these three under-vaccinated groups</p> <p>Major findings include:</p> <ul style="list-style-type: none"> • among the Dutch, most based their decision to refuse on religious beliefs • the Hutterites' decision not to immunize was due to their experiences with adverse reactions but was further supported by their use of alternative health approaches • the alternative health group were concerned with the safety of vaccines and the short- and long-term effects on their children's health 	Moderate

<p>Sporton, R. K. & Francis, S. A. (2001). Choosing not to immunize: are parents making informed decisions? <i>Family Practice</i> 18(2). 181-8.</p>	<p>Apr 1, 2001</p>	<p>Qualitative</p>	<p>N=13 low-income parents who chose not to have their children immunized</p>	<p>United Kingdom</p>	<p>Interviews with parents explored their reasons for choosing not to immunize their children</p> <ul style="list-style-type: none"> • Most parents felt they had made an informed decision, based on a reflective process including an assessment of the risks and benefits of immunization and an acceptance of responsibility for that decision • All parents identified the risk of adverse effects as a reason • Health professionals were not perceived as providers of balanced information 	<p>Moderate</p>
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References

- Bell, S., Clarke, R., Mounier-Jack, S., Walker, J. L., & Paterson, P. (2020). [Parents' and guardians' views on the acceptability of a future COVID-19 vaccine: A multi-methods study in England](#). *Vaccine* 38(49). 7789-7798.
- Blaisdell, L. L., Gutheil, C., Hootsmans, N. A., & Han, P. K. (2016). [Unknown risks: parental hesitation about vaccination](#). *Medical Decision Making* 36(4). 479-89.
- Carrion, M. L. (2018). [An ounce of prevention: Identifying cues to \(in\)action for maternal vaccine refusal](#). *Qualitative Health Research* 28(14). 2183-2194.
- Carrion, M. L. (2018). ["You need to do your research": Vaccines, contestable science, and maternal epistemology](#). *Public Understanding of Science* 27(3). 310-324.
- Chantler, T., Newton, S., Lees, A., Diggle, L., Mayon-White, R., Pollard, A. J., & Fitzpatrick, R. (2006). [Parental views on the introduction of an infant pneumococcal vaccine](#). *Community Practitioner* 79(7). 213-6.
- Diaz Crescitelli, M. E., Ghirotto, L., Sisson, H., Sarli, L., Artioli, G., Bassi, M. C., ... Hayter, M. (2020). [A meta-synthesis study of the key elements involved in childhood vaccine hesitancy](#). *Public Health* 180. 38-45.
- Dubé, E., Gagnon, D., MacDonald, N., Bocquier, A., Peretti-Watel, P., & Verger, P. (2018). [Underlying factors impacting vaccine hesitancy in high income countries: a review of qualitative studies](#). *Expert Review of Vaccines* 17(11). 989-1004.
- Duzgun, M.V. & Isler Dalgic, A. (2020). [Interventions for Prevent Parental Vaccine Refusal and Vaccine Hesitancy: A Systematic Review and Meta-Analysis of Randomized Controlled Trials](#). *PROSPERO, CRD42020157785*
- Forster, A. S., Rockliffe, L., Chorley, A. J., Marlow, L. A., Bedford, H., Smith, S. G., & Waller, J. (2016). [A qualitative systematic review of factors influencing parents' vaccination decision-making in the United Kingdom](#). *SSM – Population Health* 2. 603-612.
- Gidengil, C., Chen, C., Parker, A. M., Nowak, S., & Matthews, L. (2019). [Beliefs around childhood vaccines in the United States: A systematic review](#). *Vaccine* 37(45). 6793-6802.
- Glanz, J.M., Wagner, N.M., Narwaney, K.J., Shoup, J.A., McClure, D.L., McCormick, E.V., & Daley, M.F. (2013). [A mixed methods study of parental vaccine decision making and parent-provider trust](#). *Academic Pediatrics* 13(5). 481-8.
- Gross, K., Hartmann, K., Zemp, E., & Merten, S. (2015). ['I know it has worked for millions of years': the role of the 'natural' in parental reasoning against child immunization in a qualitative study in Switzerland](#). *BMC Public Health* 15. 373.
- Gullion, J. S., Henry, L., & Gullion, G. (2008). [Deciding to opt out of childhood vaccination mandates](#). *Public Health Nursing* 25(5). 401-8.
- Han, K., Larson, H., Chantler, T., & Iiu, M. (2021). [A systematic review of vaccination against influenza and Covid -19 among preschool children and migrants](#). *PROSPERO, CRD42021244809*

- Harmsen, I. A., Mollema, L., Ruiters, R. A., Paulussen, T. G., de Melker, H. E., & Kok, G. (2013). [Why parents refuse childhood vaccination: a qualitative study using online focus groups](#). *BMC Public Health* 13. 1183.
- Helps, C., Leask, J., Barclay, L., & Carter, S. (2019). [Understanding non-vaccinating parents' views to inform and improve clinical encounters: a qualitative study in an Australian community](#). *BMJ Open* 9(5). e026299.
- Herbert, N. L., Gargano, L. M., Painter, J. E., Sales, J. M., Morfaw, C., Murray, D., ... Hughes, J. M. (2013). [Understanding reasons for participating in a school-based influenza vaccination program and decision-making dynamics among adolescents and parents](#). *Health Education Research* 28(4). 663-72.
- Koski, K., & Holst, J. (2017). [Exploring vaccine hesitancy through an artist-scientist collaboration : Visualizing vaccine-critical parents' health beliefs](#). *Journal of Bioethical Inquiry* 14(3). 411-426.
- Kulig, J. C., Meyer, C. J., Hill, S. A., Handley, C. E., Lichtenberger, S. M., & Myck, S. L. (2002). [Refusals and delay of immunization within southwest Alberta. Understanding alternative beliefs and religious perspectives](#). *Canadian Journal of Public Health* 93(2). 109-12.
- Lewin, S., Booth, A., Glenton, C., Munthe-Kaas, H., Rashidian, A., Wainwright, M., ... Noyes, J. (2018). [Applying GRADE-CERQual to qualitative evidence synthesis findings: introduction to the series](#). *Implementation Science* 13(2).
- Majid, U. & Ahmad, M. (2020). [The factors That promote vaccine hesitancy, rejection, or delay in parents](#). *Qualitative Health Research* 30(11). 1762-1776.
- Mendel-Van Alstyne, J. A., Nowak, G. J., & Aikin, A. L. (2018). [What is 'confidence' and what could affect it?: A qualitative study of mothers who are hesitant about vaccines](#). *Vaccine* 36(44). 6464-6472.
- Mills, E., Jadad, A. R., Ross, C., & Wilson, K. (2005). [Systematic review of qualitative studies exploring parental beliefs and attitudes toward childhood vaccination identifies common barriers to vaccination](#). *Journal of Clinical Epidemiology* 58(11). 1081-8.
- Niederhauser, V. P. & Markowitz, M. (2007). [Barriers to immunizations: Multiethnic parents of under- and unimmunized children speak](#). *Journal of the American Academy of Nurse Practitioners* 19(1). 15-23.
- Nurmi, J. & Harman, B. (2021). [Why do parents refuse childhood vaccination? Reasons reported in Finland](#). *Scandinavian Journal of Public Health*. Epub ahead of print.
- Obohwemu, K., Floor, C., & Ling, J. (2021). [Parental childhood vaccine hesitancy in the UK: a systematic review protocol](#). *PROSPERO, CRD42021233539*
- Paterson, P., Chantler, T., & Larson, H. J. (2018). [Reasons for non-vaccination: Parental vaccine hesitancy and the childhood influenza vaccination school pilot programme in England](#). *Vaccine* 36(36). 5397-5401.
- Romijnders, K., van Seventer, S. L., Scheltema, M., van Osch, L., de Vries, H., & Mollema, L. (2019). [A deliberate choice? Exploring factors related to informed decision-making about](#)

- [childhood vaccination among acceptors, refusers, and partial acceptors](#). *Vaccine* 37(37). 5637-5644.
- Rosso, A., Massimi, A., Pitini, E., Nardi, A., Baccolini, V., Marzuillo, C., ... Villari, P. (2020). [Factors affecting the vaccination choices of pregnant women for their children: a systematic review of the literature](#). *Human Vaccines & Immunotherapeutics* 16(8). 1969-1980.
- Skirrow, H., Barnett, S., Bell, S., Riaposova, L., Mounier-Jack, S., Kampmann, B., & Holder, B. (2021). [Women's views on accepting COVID-19 vaccination during and after pregnancy, and for their babies: A multi-methods study in the UK](#). *PREPRINT*.
- Smith, L. E., Hodson, A., & Rubin, G. J. (2021). [Parental attitudes towards mandatory vaccination; a systematic review](#). *PREPRINT*.
- Swaney, S. E. & Burns, S. (2019). [Exploring reasons for vaccine-hesitancy among higher-SES parents in Perth, Western Australia](#). *Health Promotion Journal of Australia* 30(2). 143-152.
- Sporton, R. K. & Francis, S. A. (2001). [Choosing not to immunize: are parents making informed decisions?](#). *Family Practice* 18(2). 181-8.
- Tarrant, M., & Gregory, D. (2003). [Exploring childhood immunization uptake with First Nations mothers in north-western Ontario, Canada](#). *Journal of Advanced Nursing*, 41(1), 63-72.
- Tarrant, M., & Gregory, D. (2001). [Mothers' perceptions of childhood immunizations in First Nations communities of the Sioux lookout zone](#). *Canadian Journal of Public Health*, 92(1), 42-45.
- Ten Kate, J., Koster, W., & Van der Waal, J. (2021). ["Following Your Gut" or "Questioning the Scientific Evidence": Understanding Vaccine Skepticism among More-Educated Dutch Parents](#). *Journal of Health and Social Behavior* 62(1). 85-99.
- Tickner, S., Leman, P. J., & Woodcock, A. (2010). [Parents' views about pre-school immunization: an interview study in southern England](#). *Child: Care, Health and Development* 36(2). 190-7.
- Ward, P. R., Attwell, K., Meyer, S. B., Rokkas, P., & Leask, J. (2017). [Understanding the perceived logic of care by vaccine-hesitant and vaccine-refusing parents: A qualitative study in Australia](#). *PLoS One* 12(10). e0185955.
- Whyte, M. D., Whyte Iv, J., Cormier, E., & Eccles, D. W. (2011). [Factors influencing parental decision making when parents choose to deviate from the standard pediatric immunization schedule](#). *Journal of Community Health Nursing* 28(4). 204-14.
- White, T., Sevdalis, N., Willaby, H., King, C., & Leask, J. (2013). [Systematic review of factors underlying parental decisions about childhood vaccinations. Update of brown et al. 2010](#). *PROSPERO, CRD42013005417*
- Wiley, K. E., Leask, J., Attwell, K., Helps, C., Degeling, C., Ward, P., & Carter, S. M. (2020). [Parenting and the vaccine refusal process: A new explanation of the relationship between lifestyle and vaccination trajectories](#). *Social Science & Medicine* 263. 113259.