**Supplementary Table 1. Summary of recently published literature reviews on determinants of vaccine acceptance and hesitancy**

| **First author/ Year of publication/ Title** | **Description of the reviews** | **Nb of studies included** | **Quality assessment of studies** | **Main conclusions** |
| --- | --- | --- | --- | --- |
| **General Purpose and setting** | **Inclusion / Exclusion criteria** | **Main outcome measure** |
| Bocquier, A., 2017, *Socioeconomic differences in childhood vaccination in developed countries: a systematic review of quantitative studies* | To analyze evidence about the associations between parental socioeconomic status (SES) and 1) childhood vaccine uptake and 2) cognitive determinants of parents' decisions about childhood vaccination | **Inclusion:*** Articles in English
* Targeted children (birth to 12 years) and their parents living in developed countries ranked "very high" in the 2014 United Nations Human Development Index (HDI)
* SES included education, occupation, income or any combination of these variables
* Presenting results from multivariate analyses in longitudinal, cross-sectional or case-control studies
* Data collected in 2000 or later
* Showing moderate global quality rating according to an adaptation of the Effective Public Health Practice Project

**Exclusion:*** Studies with outcome for the HPV vaccine and for vaccines not publicly funded during the study period
 | Childhood vaccine uptake and cognitive determinants of the parental decision about their child's vaccination | 43 articles | Reported | * Thirty-four of the 43 included articles analyzed SES differences in childhood vaccine uptake, while 7 examined differences in its cognitive determinants and 2 measuring both outcomes.
* Sixteen articles came from North America countries (USA, Canada), 18 from Europe (Belgium, UK, Ireland, Germany, Greece, and Italy) and 2 from Australia.
* Study design was cross-sectional in 27 articles, cohort in 6 and case-control in 3. Fifteen used data representative at the national level while other were conducted at the state/regional, local or county/district level.
* Results varied across types of vaccines and countries. For series of recommended vaccines, some evidence of higher completion rates among high-SES children in several settings where universal programs provide 100% free vaccines to all children.
* The same gradient was found for some vaccines only partially free of charge such as rotavirus vaccine in Belgium. For MMR vaccines, some evidence were found for an inverse relation (i. e. lower uptake among high-SES children) in various settings such as the UK and Germany.
* Results were inconsistent for studies analyzing SES differences in cognitive determinants of parents' childhood vaccination decisions and the study examining the potential mediating effect of parental beliefs on the relation between SES and childhood vaccine uptake found such an effect.
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| Forster, A.S., 2016, *A qualitative systematic review of factors influencing parents’ vaccination decision-making in the United Kingdom* | To understand the factors influencing UK parents' decisions to vaccinate a child | **Inclusion:*** Articles published in peer reviewed journals
* Articles written in English
* Reporting qualitative findings (e.g. from interviews, focus groups, free-text survey responses)
* No time restriction

**Exclusion:*** Letters, dissertation abstracts, book chapters, reviews and commentaries
 | Factors influencing parents' vaccination decisions | 34 articles | Reported | * The majority of articles focused on MMR vaccine (n=17) or vaccination in general (n=11) and most used interviews (n=18) of focus groups (n=9).
* The authors’ thematic synthesis identified two types of decision-making used by parents: non-deliberative and deliberative.
* Both approaches were not mutually exclusive and there was evidence that some parents adopted both at different times.
* Non-deliberative decisions were characterized by those in which parents were happy to comply, where parents did not think they had a choice, and/or relied on social norms.
* Deliberative decisions were those involving parents' weighing up the risks and benefits of vaccination, making an assessment of the appropriateness of vaccinating their child based on others advice/experiences and social judgment.
* Parents' emotions affected the themes within deliberative decision-making, and the media sometimes influenced this. Trust was affected by the media.
* Practical issues influenced whether those who intended to vaccinate their children actually did so.
 |
| Fournet, N., 2018, *Under-vaccinated groups in Europe and their beliefs, attitudes and reasons for non-vaccination; two systematic reviews* | To identify and describe under-vaccinated groups (UVGs) in Europe and to describe their beliefs, attitudes and reasons for non-vaccination | **Inclusion:*** Articles published in English in peer reviewed journals
* Published between 1950 and May 2013
* Focus on UVGs
* Both qualitative and quantitative study design
* Studies conducted in European countries

**Exclusion:*** Focus on general population or people living together in closed settings as prisons or nursing homes or some groups who are (partly) refusers or hard-to-reach but are not easily identifiable.
 | Beliefs, attitudes and reasons for non-vaccination among each UVG found in the literature | 48 articles for the first search and 13 articles for the second search | Not reported | * Five UVGs were identified through the first search: Orthodox Protestants (n=11), Anthroposophists (n=9), Roma (n=18), Irish Travellers (n=7), and Orthodox Jewish communities (n=2). Two articles mentioned 2 UVGs and 1 article mentioned 4 UVGs.
* For their second search, authors included 1 article About Orthodox Protestants, 4 about Roma, 3 about Irish Travellers and 1 about both groups, 2 about Anthroposophists, and 2 about Orthodox Jewish communities.
* A variety of beliefs and objections to vaccination were reported among each group. Not all members have the same beliefs.
* Some similar beliefs were shared between different groups. The most frequently mentioned shared reasons for not vaccinating their children are: the perceived non-severity of the disease, the perceived un-safety of the vaccine (e.g. the fear of side effects and misconceptions), and the need for more information or the lack of information about for example risks of vaccination.
* Each UVG has its own specific factors. Low vaccination coverage for certain diseases among the Anthroposophists could be explained by their specific philosophy of a healthy lifestyle. For Orthodox Protestant, firm trust in Divine Providence seems to be the most important reason for not being vaccinated. This religious factor is incidentally also found among the Orthodox Jewish communities. Low vaccination coverage among Roma and the Irish Travellers communities is predominantly explained by poor access to health care services due to mobility.
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| Kurup, L., 2017, *An integrative review on parents’ perceptions of their children’s vaccinations* | To summarize the current body of evidence and to provide a comprehensive overview of the perceptions of parents with children eligible for vaccinations | **Inclusion:*** Articles published in English between 2005 and 2016
* Both qualitative and quantitative study design
* Involving mandatory and optional vaccines
* Limited to studies involving children below 6 years of age
* Achieving at least 60% of the JBI criteria for methodology quality

**Exclusion:*** Studies recruiting parents of children with disabilities
* Studies involving school-based vaccination
 | Parental perceptions regarding their child’s vaccination | 20 articles (10 qualitative design, 10 quantitative one) | Assessed for inclusion | * 15 studies were conducted in Western countries, 4 in Asia and 1 in the Middle East.
* The parents had varied views on vaccination and they had many vaccination-related concerns and difficulties.
* By example, parents often viewed vaccinations as a social responsibility, whereby everyone had a duty to ensure that their children were vaccinated. Social influences and experiences of the vaccination may also influence parental views.
* Regarding vaccination-related concerns and difficulties, these included side effects, vaccination safety, vaccination-related pain and inconveniences.
* Different factors influenced their vaccination decisions and they had varied support needs. Physician recommendation was the most commonly cited factor in influencing parents’ vaccination decisions. Social and cultural influences especially differences between the countries of origin in the published studies also affected parental choices regarding their children’s vaccinations. Accessibility and affordability of vaccination services also promoted vaccination uptake.
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| Smith, L.E., 2017, *A systematic review of factors affecting vaccine uptake in young children* | To identify psychological, social and contextual factors affecting the uptake of routine childhood vaccination for healthy children aged 5 and under in high-income countries | **Inclusion:*** Published in English
* Studies conducted with children aged 5 years or under
* Qualitative and quantitative study design
* Studies conducted in high-income countries
* Presented data on uptake of a named vaccine and if the vaccine was part of the routine vaccination schedule in that region
* Presented data on the association between possible psychological predictors and childhood vaccination, or gave a quantitative account of parents’ self-reported reasons for or against vaccination

**Exclusion:*** Studies recruiting of children because of pre-existing ill health
* Presented only data on demographic predictors or predictors related to the mode of delivery of information, present of an intervention, or frequency of vaccination appointment reminders
 | Uptake of routine vaccines in young children | 68 articles | Reported | * Included studies were conducted in twelve countries and investigated thirteen vaccines. Thirty-seven studies used cross-sectional designs, fifteen used case-control designs and twelve used cohort designs.
* There is strong evidence or an association between vaccination uptake and: not perceiving vaccines to cause adverse effects; general positive attitudes towards vaccination; positive vaccine recommendations; and perceiving fewer practical difficulties of vaccination.
* While there was good evidence for an association between vaccination and perceived susceptibility to the illness, evidence for an association between perceived severity of an illness and vaccination was weak.
* Other factors associated with vaccination include knowledge about the vaccine, social influences and trust in the healthcare profession.
* Having increased information about the vaccine was associated with vaccination, but the influence of different sources of information needs more research.
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| Tabacchi, G., 2016, *Determinants of European parents’ decision on the vaccination of their children against measles, mumps and rubella: A systematic review and meta-analysis* | To identify the main factors associated with partial and full MMR vaccination uptake in European parents and performing a meta-analysis of the main classes of factors predicting parental MMR vaccine catch-up | **Inclusion:*** Published between 2000 and 2014 in English
* Studies conducted in European countries
* Qualitative and quantitative study design
* Focus on routine childhood vaccinations against MMR

**Exclusion:*** Published in a language different from English
* Studies conducted in non-European countries or rural areas only
* Studies reporting vaccination information on sick populations, very pre-term infants and migrants
* Studies reporting only the impact of the coverage of vaccination or not reporting direct linking with uptake
* Studies reporting uptake determinants not on parents
* Focus groups with less than 10 parents were arbitrarily excluded
* Methodology studies or papers reporting no specific indications on MMR
 | Factors associated with MMR vaccine uptake by parents | 45 articles included in the qualitative synthesis; 26 articles included in the meta-analysis | Assessed for studies included in the meta-analysis | * The results of the qualitative synthesis showed that most parents are not totally directed to one clear attitude toward vaccination.
* Factors associated with lower MMR vaccine uptake were misleading knowledge, beliefs and perceptions on vaccines, negative attitudes and behaviors toward vaccination, demographic characteristics, higher child’s age, low socio-economic status, especially low income and education, high number of children, irregular marital status.
* The factors explaining heterogeneity were country location, administration modality, collection setting and responses reported on MMR alone or in combination.
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| Tauil, M., 2016, *Factors associated with incomplete or delayed vaccination across countries: A systematic review* | To review factors that influence the adherence to childhood vaccination schedule in different countries, especially related to socioeconomic conditions and healthcare system characteristics | **Inclusion:*** Observational studies published in peer-reviewed journals in English, Spanish and Portuguese
* Published from January 1992 to June 2014
* Articles that assessed vaccination schedule with at least 3 diphtheria-tetanus-pertussis, 3 polio and 1 measles vaccines in children aged 0-24 months

**Exclusion:*** Off topic
* Not a primary study
 | Adherence to childhood vaccination schedule (measured by completeness and/or timeliness) | 23 articles | Not reported | * Among studies, 14 referred to completeness, 7 to timeliness and 2 to both.
* Most cited factors were higher birth order and low maternal education/socioeconomic status.
* Irregular monitoring by the healthcare system was reported by countries with "mainly private" healthcare system.
* Out-of-hospital birth, no reminder(s) about the next follow-up visit, and mother working outside the home were cited by countries with low/medium HDI.
* In countries with very high HDI, ethnicity, use of private healthcare services and no health insurance were cited.
* The role of migration on vaccination coverage was reported by 3 studies in settings with distinct characteristics.
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**Supplementary Table 2. ENTREQ Statement**

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| --- | --- |
| **No. Item** | **Description** |
| 1. Aim | **To review the existing qualitative literature on parents’ attitudes toward childhood vaccination** |
| 2. Synthesis methodology | **The socio-ecological model was used as a conceptual framework to conduct a thematic analysis. It offers a comprehensive and pragmatic approach for developing effective health promotion programs centered on a specific behavior and which are capable of targeting change at multiple levels. Salient factors explaining parental decision-making about childhood vaccination were mapped on Peretti-Watel et al.’s model of vaccine hesitancy** |
| 3. Approach to searching | **A comprehensive search strategy was developed to retrieve all available articles related to the research question** |
| 4. Inclusion criteria | **Inclusion criteria: (1) studies focused on the views, decision-making or experiences of parents, parents to be or informal caregivers (hereafter, referred to as “parents”) regarding vaccinations for children under the age of 5; (2) studies using qualitative methods for both data collection (e.g., interviews, focus groups discussion) and data analysis (e.g., constant comparison, grounded theory); (3) studies conducted in countries that ranked “very high” on the 2016 United Nations (UN) Human Development Index (HDI); and (4) peer-reviewed studies.****Exclusion criteria: (1) studies targeting hypothetical vaccines, vaccines given to teenagers, vaccines given in responses to an outbreak situation, or specific vaccines; (2) studies conducted among specific populations (e.g., hard-to-reach / under-vaccinated, low SES, chronically-ill); (3) studies conducted to inform or pre-test communication tools or approaches to educate or inform parents about childhood vaccination, studies analyzing interactions on childhood vaccination between health care professionals and parents vaccines, and studies analyzing social media content on vaccination; (4) editorial, letters, conferences abstracts, thesis and commentaries.** |
| 5. Data sources | **The following electronic databases were searched: MEDLINE & Embase (OvidSP); Cumulative Index to Nursing and Allied Health Literature – CINAHL, PsyInfo, ERIC and SocINDEX (EBSCOhost). All data were limited to publications in English or French from the last 10 years (from 2007 to 2017).** |
| 6. Electronic search strategy | **Electronic search strategy is outlined in Supplementary Table 3.** |
| 7. Study screening methods | **Two independent reviewers (ED, DG) screened study titles and abstracts for suitability against inclusion and exclusion criteria. It was required that both reviewers agreed on the decision to include or exclude a study.**  |
| 8. Study characteristics | **Study characteristics is outlined in Supplementary Table 4.** |
| 9. Study selection results | **The study selection process is outlined in Figure 2.**  |
| 10. Rationale for appraisal | **The rational for appraisal was used to assess the quality of the authors’ description of their methods and theoretical approaches.** |
| 11. Appraisal items | **A modified version of CASP guidelines was used to appraise the included studies.**  |
| 12. Appraisal process | **Appraisal was conducted independently by two independent reviewers (ED, DG). The two reviewers discussed if consensus was required.** |
| 13. Appraisal results | **Appraisal results are presented in Supplementary Table 4.** |
| 14. Data extraction | **To extract data, a unified matrix was used to record the characteristics of included studies. Extracted data for each included studies are presented in Supplementary Table 4.** |
| 15 Software | **Endnotes software was used to manage databases search results. NVivo V10 was used to conduct content analysis.** |
| 16. Number of reviewers | **Two reviewers (ED, DG) were involved in reading all included studies and constructing the key concepts. Six reviewers (ED, DG, NM, AB, PPW, PV) were involved in the synthesis of the findings.** |
| 17. Coding | **Thematic content analysis was used to identify the main themes across the included studies. The analysis was based on the socio-ecological model.**  |
| 18. Study comparison | **Similar findings were coded into key themes and categories within and across studies. Key themes reflecting the main findings of all included studies are presented in Table 1.** |
| 19. Derivation of themes | **The process of deriving the themes was deductive and based on the socio-ecological model. Within each theme, sub-themes were developed inductively, moving from specific findings in one study to more general observations across studies.** |
| 20. Quotations | **Direct quoted from study participants of included studies are provided in Table 1.** |
| 21. Synthesis output | **The key findings were mapped on Peretti-Watel’s model of vaccine hesitancy. Figure 3 illustrates the synthesis output.** |

**Supplementary Table 3. Search strategies**

**Medline (Ovid)**

|  |  |
| --- | --- |
| **#** | **Search Terms** |
| 1 | exp \*immunization/ or exp \*vaccines/ or exp \*"immunization programs"/ |
| 2 | (immuni#ation\* or immuni#e\* or immuni#ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*).ti,ab. |
| 3 | 1 or 2 |
| 4 | attitude/ or exp "attitude to health"/ or "choice behavior"/ or "consumer behavior"/ or culture/ or "decision making"/ or exp "health behavior" or knowledge/ or motivation/ or "public opinion"/ or "refusal to participate"/ or "rejection (psychology)"/ or "social determinants of health"/ or "social norms"/ or "social perception"/ or "social values"/ or trust/ or uncertainty/ |
| 5 | (accept\* or adherence or attitude\* or barrier\* or behavio?r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or reluctan\* or refus\* or satisfaction or trust\* or uptak\* or view\* or willing\*).ti,ab. |
| 6 | 4 or 5 |
| 7 | exp parents/ or parenting/ or "pregnant women"/ |
| 8 | (((informal or primary) adj (caregiver\* or (care adj giver\*))) or father\* or mother\* or parent\* or (pregnant adj wom#n) or guardian\*).ti,ab. |
| 9 | 7 or 8 |
| 10 | "maternal behavior"/ or "paternal behavior"/ |
| 11 | "vaccination refusal"/ |
| 12 | 2 adj8 5 |
| 13 | 1 and 4 and 9 |
| 14 | 10 and 3 |
| 15 | 11 and 9 |
| 16 | 12 and 9 |
| 17 | or/13-16 |
| 18 | "focus groups"/ or "interviews as topic"/ or exp narration/ or observation/ or "qualitative research"/ or "grounded theory"/ |
| 19 | (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) adj2 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus adj group\*) or (group adj discussion\*) or observation\* or (grounded adj theor\*) or ((document\* or thematic) adj analysis)).ti,ab. |
| 20 | 18 or 19 |
| 21 | 17 and 20 |
| 22 | 21 not (exp animals/ not humans/) |
| 23 | 22 not (news or comment or editorial).pt |
| 24 | 23 and (english or french).lg |
| 25 | limit 24 to yr="2007 - 2017" |

**Embase (Ovid)**

|  |  |
| --- | --- |
| **#** | **Search Terms** |
| 1 | \*immunization/ or exp \*vaccination/ or \*vaccine/ |
| 2 | (immuni#ation\* or immuni#e\* or immuni#ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*).ti,ab. |
| 3 | 1 or 2 |
| 4 | attitude/ or "attitude to health"/ or "consumer attitude"/ or "decision making"/ or "health behavior"/ or "health belief"/ or knowledge/ or learning/ or motivation/ or "patient decision making"/ or exp "patient attitude"/ or perception/ or "public opinion"/ or "social behavior"/ or "social determinants of health"/ or "social norm"/ or trust/ |
| 5 | (accept\* or adherence or attitude\* or barrier\* or behavio?r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or reluctan\* or refus\* or satisfaction or trust\* or uptak\* or view\* or willing\*).ti,ab. |
| 6 | 4 or 5 |
| 7 | exp parent/ or pregnant woman/ |
| 8 | (((informal or primary) adj (caregiver\* or (care adj giver\*))) or father\* or mother\* or parent\* or (pregnant adj wom#n) or guardian\*).ti,ab. |
| 9  | 7 or 8 |
| 10 | exp "family attitude"/ or exp "parental behavior"/ or "family decision making"/ |
| 11 | 2 adj8 5 |
| 12 | 1 and 4 and 9 |
| 13 | 10 and 3 |
| 14 | 11 and 9 |
| 15 | or/12-14 |
| 16 | "qualitative research"/ or "thematic analysis"/ or exp interview/ or "grounded theory"/ |
| 17 | (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) adj2 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus adj group\*) or (group adj discussion\*) or observation\* or (grounded adj theor\*) or ((document\* or thematic) adj analysis)).ti,ab. |
| 18 | 16 or 17 |
| 19 | 15 and 18 |
| 20 | animal/ not human/ |
| 21 | 19 not 20 |
| 22 | 21 not (news or comment or editorial).pt |
| 23 | 22 and (english or french).lg |
| 24 | limit 23 to yr="2007 - 2017" |

**ERIC (EBSCOhost)**

|  |  |
| --- | --- |
| **#** | **Search Terms** |
| 1 | DE "immunization programs" |
| 2 | **TI** (immune?ation\* or immune?e\* or immune?ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*) OR **AB** (immune?ation\* or immune?e\* or immune?ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*) |
| 3 | S1 OR S2 |
| 4 | DE (attitudes or beliefs or "behavior standards" or "compliance (psychology)" or culture or "decision making" or "health behavior" or learning or intention or motivation or "negative attitudes" or opinions or "positive attitudes" or preferences or "public opinion" or "resistance (psychology)" or satisfaction or "social behavior" or "sociocultural patterns" or "trust (psychology)" or "world views") |
| 5 | **TI** (accept\* or adherence or attitude\* or barrier\* or behavio#r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or refus\* or reluctan\* or satisfaction or trust\* or uptak\* or view\* or willing\*) OR **AB** (accept\* or adherence or attitude\* or barrier\* or behavio#r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or refus\* or reluctan\* or satisfaction or trust\* or uptak\* or view\* or willing\*) |
| 6 | S4 OR S5 |
| 7 | DE (parents or mothers or fathers or "unwed mothers") |
| 8 | **TI** (((informal or primary) W0 (caregiver\* or (care W0 giver\*))) or father\* or mother\* or parent\* or (pregnant W0 wom?n) or guardian\*) OR **AB** (((informal or primary) W0 (caregiver\* or (care W0 giver\*))) or father\* or mother\* or parent\* or (pregnant W0 wom?n) or guardian\*) |
| 9  | S7 OR S8 |
| 10 | DE ("parent attitudes" or "father attitudes" or "mother attitudes") |
| 11 | S1 AND S4 AND S9 |
| 12 | S3 AND S10 |
| 13 | S9 AND (S2 N7 S5) |
| 14 | S11 OR S12 OR S13 |
| 15 | DE ("qualitative research" or ethnography or observation or "grounded theory" or "field studies" or "focus groups" or "group discussion" or interviews or "naturalistic observation" or "participant observation" or "semi structured interviews" or "structured interviews") |
| 16 | **TI** (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) N1 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus W0 group\*) or (group W0 discussion\*) or observation\* or (grounded W0 theor\*) or ((document\* or thematic) W0 analysis)) OR **AB** (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) N1 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus W0 group\*) or (group W0 discussion\*) or observation\* or (grounded W0 theor\*) or ((document\* or thematic) W0 analysis)) |
| 17 | S15 OR S16  |
| 18 | S14 AND S17 |
| 19 | S18 AND LA (english OR french) |
| 20 | S19 + time limits (2007-2017) |

**CINAHL (EBSCOhost)**

|  |  |
| --- | --- |
| **#** | **Search Terms** |
| 1 | **MM** (immunization+ OR "immunization program" OR vaccines+) |
| 2 | **TI** (immune?ation\* or immune?e\* or immune?ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*) or **AB** (immune?ation\* or immune?e\* or immune?ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*) |
| 3 | S1 OR S2 |
| 4 | **MH** (attitudes or "attitude to health" or behavior or confidence or culture or "cultural values" or "decision making" or "health beliefs" or "health behavior" or knowledge or "health knowledge" or intention or motivation or "patients attitudes" or "consumer attitudes" uncertainty or "patient compliance+" or patient dropouts" or "personal values" or "public opinion" or "social values" or "refusal to participate" or "social determinants of health" or "social norms" or "social attitudes" or trust or "treatment refusal") |
| 5 | **TI** (accept\* or adherence or attitude\* or barrier\* or behavio#r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or refus\* or reluctan\* or satisfaction or trust\* or uptak\* or view\* or willing\*) OR **AB** (accept\* or adherence or attitude\* or barrier\* or behavio#r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or refus\* or reluctan\* or satisfaction or trust\* or uptak\* or view\* or willing\*) |
| 6 | S4 OR S5 |
| 7 | MH (parents+) |
| 8 | TI (((informal or primary) W0 (caregiver\* or (care W0 giver\*))) or father\* or mother\* or parent\* or (pregnant W0 wom?n) or guardian\*) OR AB (((informal or primary) W0 (caregiver\* or (care W0 giver\*))) or father\* or mother\* or parent\* or (pregnant W0 wom?n) or guardian\*) |
| 9  | S7 OR S8 |
| 10 | MH ("decision making, family" or "family attitudes+" or "maternal behavior" or "paternal behavior" or "parental behavior") |
| 11 | MH ("attitude to vaccines") |
| 12 | S1 AND S4 AND S9 |
| 13 | S3 AND S10 |
| 14 | S9 AND S11 |
| 15 | S9 AND (S2 N7 S5) |
| 16 | S12 OR S13 OR S14 OR S15 |
| 17 | MH ("focus groups" or interviews+ or narratives or "observational methods+" or "qualitative studies+") |
| 18 | **TI** (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) N1 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus W0 group\*) or (group W0 discussion\*) or observation\* or (grounded W0 theor\*) or ((document\* or thematic) W0 analysis)) OR **AB** (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) N1 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus W0 group\*) or (group W0 discussion\*) or observation\* or (grounded W0 theor\*) or ((document\* or thematic) W0 analysis)) |
| 19 | S17 OR S18 |
| 20 | S16 AND S19 |
| 21  | S20 NOT PT (editorial OR commentary) |
| 22 | S21 AND LA (english OR french) |
| 23 | S22 + time limits (2007-2017) |

**PsycINFO (Ebscohost)**

|  |  |
| --- | --- |
| **#** | **Search Terms** |
| 1 | DE (immunization) |
| 2 | **TI** (immune?ation\* or immune?e\* or immune?ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*) or **AB** (immune?ation\* or immune?e\* or immune?ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*) |
| 3 | S1 OR S2 |
| 4 | DE ("behavioral intention" or "choice behavior" or "client attitudes" or "client satisfaction" or "decision making" or "health attitudes" or "health behavior" or "health knowledge" or intention or motivation or "personal values" or "public opinion" or "social norms" or "social values" or "treatment compliance" or "treatment refusal" or "trust (social behavior)") |
| 5 | **TI** (accept\* or adherence or attitude\* or barrier\* or behavio#r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or refus\* or reluctan\* or satisfaction or trust\* or uptak\* or view\* or willing\*) OR **AB** (accept\* or adherence or attitude\* or barrier\* or behavio#r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or refus\* or reluctan\* or satisfaction or trust\* or uptak\* or view\* or willing\*) |
| 6 | S4 OR S5 |
| 7 | DE (parents or fathers or mothers or "single parents" or "expectant parents" or "adoptive parents" or "surrogate parents (humans)" or "foster parents") |
| 8 | TI (((informal or primary) W0 (caregiver\* or (care W0 giver\*))) or father\* or mother\* or parent\* or (pregnant W0 wom?n) or guardian\*) OR AB (((informal or primary) W0 (caregiver\* or (care W0 giver\*))) or father\* or mother\* or parent\* or (pregnant W0 wom?n) or guardian\*) |
| 9  | S7 OR S8 |
| 10 | DE ("parental attitudes") |
| 11 | S1 AND S4 AND S9 |
| 12 | S3 AND S10 |
| 13 | S9 AND (S2 N7 S5) |
| 14 | S11 OR S12 OR S13 |
| 15 | DE ("qualitative research" or "grounded theory" or "observation methods" or interviews or "group discussion" or narratives) |
| 16 | **TI** (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) N1 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus W0 group\*) or (group W0 discussion\*) or observation\* or (grounded W0 theor\*) or ((document\* or thematic) W0 analysis)) OR **AB** (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) N1 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus W0 group\*) or (group W0 discussion\*) or observation\* or (grounded W0 theor\*) or ((document\* or thematic) W0 analysis)) |
| 17 | S15 OR S16  |
| 18 | S14 AND S17 |
| 19 | S18 AND LA (english OR french) |
| 20 | S19 + time limits (2007-2017) |

**SocINDEX (EBSCOhost)**

|  |  |
| --- | --- |
| **#** | **Search Terms** |
| 1 | SU (immunization or "immunization of children" or vaccination) |
| 2 | **TI** (immune?ation\* or immune?e\* or immune?ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*) OR **AB** (immune?ation\* or immune?e\* or immune?ing or vaccin\* or anti-vaccin\* or antivaccin\* or pro-vaccin\* or provaccin\*) |
| 3 | S1 OR S2 |
| 4 | SU ("acceptance (psychology)" or "attitudes toward health" or behavior or confidence or culture or "decision making" or "health behavior" or "motivation (psychology)" or "patients’ attitudes" or "patient compliance" or "patient satisfaction" or perception or "public opinion" or "social attitudes" or "social norms" or "social values" or uncertainty or trust) |
| 5 | **TI** (accept\* or adherence or attitude\* or barrier\* or behavio#r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or refus\* or reluctan\* or satisfaction or trust\* or uptak\* or view\* or willing\*) OR **AB** (accept\* or adherence or attitude\* or barrier\* or behavio#r\* or belief\* or choice\* or compliance or confidence or cultur\* or decision\* or determinant\* or dislik\* or distrust\* or doubt\* or dropout\* or drop-out\* or exemption\* or expectation\* or experience\* or fear\* or hesita\* or intention\* or knowledge or mistrust\* or motivat\* or nonadherence or non-adherence or noncompliance or non-compliance or opinion\* or participat\* or perception\* or practice\* or preference\* or reason\* or refus\* or reluctan\* or satisfaction or trust\* or uptak\* or view\* or willing\*) |
| 6 | S4 OR S5 |
| 7 | SU (parents or fathers or mothers or "single parents" or "adoptive parent" or "pregnant women" or "foster parents" or "first-time parents" or "older parents") |
| 8 | **TI** (((informal or primary) W0 (caregiver\* or (care W0 giver\*))) or father\* or mother\* or parent\* or (pregnant W0 wom?n) or guardian\*) OR **AB** (((informal or primary) W0 (caregiver\* or (care W0 giver\*))) or father\* or mother\* or parent\* or (pregnant W0 wom?n) or guardian\*) |
| 9  | S7 OR S8 |
| 10 | SU ("attitudes of mothers" or "fathers’ attitudes" or "parent attitudes") |
| 11 | SU ("anti-vaccination movement" or "vaccine refusal") |
| 12 | S1 AND S4 AND S9 |
| 13 | S3 AND S10 |
| 14 | S9 AND S11 |
| 15 | S9 AND (S2 N7 S5) |
| 16 | S12 OR S13 OR S14 OR S15 |
| 17 | SU ("qualitative research" or "focus groups" or "conversation analysis" or "participant observation" or interviewing or "interviewing in psychology" or "observation (psychology)") |
| 18 | **TI** (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) N1 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus W0 group\*) or (group W0 discussion\*) or observation\* or (grounded W0 theor\*) or ((document\* or thematic) W0 analysis)) or **AB** (("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face-to-face" or structured or guide) N1 (interview\* or discussion\* or questionnaire\*) or ethnograph\* or fieldwork\* or (focus W0 group\*) or (group W0 discussion\*) or observation\* or (grounded W0 theor\*) or ((document\* or thematic) W0 analysis)) |
| 19 | S17 OR S18 |
| 20 | S16 AND S19 |
| 21  | S20 NOT ZT (editorial OR commentary) |
| 22 | S21 AND LA (english OR french) |
| 23 | S22 + time limits (2007-2017) |

**Supplementary Table 4. Summary of included studies**

| **First author, Year of publication** | **Aim of the study** | **Study location** | **Study time period**  | **Method of data collection** | **Method of analysis** | **Description of participants** | **Summarized findings** | **Quality of reporting** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attwell, K., 2017 | To understand what is about the expert system behind vaccination (the allopathic healthcare) that leads some parents to distrust both its "access points" (healthcare professionals in particular) and the system as a whole | Australia (2 cities Fremantle & Adelaide) | Included 2 studiesIn Fremantle: 2013-2014In Adelaide: 2015 | Semi-structured interviews | Application of deductive social theoretical reasoning with a narrative analysis approach | 27 parents with a history of vaccine rejection (9 from Fremantle; 18 from Adelaide)10 parents had never vaccinated; 5 commenced but ceased; 7 currently delaying or partially vaccinating; 5 former delayers now up to date | * Parents' perceptions of the profit motive generate distrust in the expert systems pertaining to vaccination.
* Parents' distrust specifically pertained to the pharmaceutical industry and the means by which it "infiltrated" other systems (research, health professionals, and government), diminishing trust in allopathic healthcare.
* Vaccine recommendations are seen as being in conflict with the interest of the child and "the system" underscored by malign intent, even in individual representatives of this system were not equally tainted.
 | Strong |
| Austvoll-Dahlgren, A. 2010 | To identify parents' decision-making processes in relation to childhood vaccinations, including barriers and facilitators to searching for information | Norway | 2008 | Semi-structured interviews & focus groups | Grounded theory approach & framework analysis to manage the data | 10 parents (8 mothers; 2 fathers)All parents have decided to vaccinate their children | * Parents' decision-making about vaccination was based on trust in the recommendations of the Norwegian health system, a common-sense notion that vaccination were "just something you do", and experiences and tradition among family and friends.
* Being positive towards vaccination and being decided were found to be main barriers to participation and obtaining information; other factors were perceptions about own abilities and capacity.
* Being inadequately informed may result in low confidence in one’s own decision and uncertainty about rights and responsibilities in decision-making
* Public health nurses were the parents’ most important source of information.
* Uninformed or less informed parents expressed low conﬁdence about the decision they had made and uncertainty about their rights and responsibilities in decision-making.
 | Strong |
| Blaisdell, L.L., 2016 | To explore the extent to which parents perceive ambiguity in vaccine-associated risks and the thought processes underlying their subjective judgments of risk and uncertainty in decisions about vaccination | (Portland, Maine) | Unknown | Semi structured focus groups | Constant comparative method and inductive grounded theory approach | 42 vaccine-hesitant parents28 parents were vaccine-hesitant, while other were refusing parents | * Vaccine hesitant parents engage in various reasoning processes and tend to perceive risks of vaccination as greater than the risks of vaccine preventable diseases.
* Vaccine hesitant parents engage in other reasoning processes that lead them to perceive ambiguity in information about the harms of vaccination—citing concerns about the missing, conflicting, changing, or otherwise unreliable nature of information.
 | Strong |
| Brunson, E.K., 2013 | To examine parents' vaccination decision-making in order to develop a clearer understanding of this process | United States(King County in Western Washington State) | Unknown | Semi-structured interviews | Grounded theory approach | 15 mothers and 3 couples7 children were completely vaccinated, 7 partly and 4 were completely unvaccinated | * Parents' personality, background, and previous life experiences influence their decision-making as well as the decisions they ultimately reach.
* Stages identified in the decision-making process included: awareness, assessing and choosing, followed by either stasis or ongoing assessment;
* Three general assessment groups exist: acceptors, who rely primarily on general social norms to make their vaccination decisions; reliers, who rely primarily on other people for information and advice; and searchers, who seek for information on their own, primarily from published sources.
 | Strong |
| Dubé, E., 2016 | To better understand why mothers decide to have their newborn vaccinated or not, with a particular focus on vaccine-hesitant mothers | Canada(various areas in the province of Quebec) | First interviews : 2011-2012 Second interviews: 2012-2013 | Semi-structured interviews | Content analysis inspired by Grounded theory | 56 pregnant women, 55 of them were re-interviewed as mothers (3 to 11 months after birth)24 mothers categorized after first interview as favorable, 25 vaccine-hesitant and 6 vaccine unfavorable | * Almost half of mothers were categorized as vaccine-hesitant.
* Various factors influenced mothers' vaccine decision-making.
* At follow-up, the majority of vaccine-hesitant mothers chose to follow the recommended vaccine schedule but they were still ambivalent and continued to question their decision.
 | Strong |
| Enkel, S.L., 2017 | To identify the behaviors, knowledge and attitudes of "hesitant compliers" | Australia (Perth, Western Australia) | Unknown | Semi-structured interviews | Inductive inquiry methods | 10 parents (9 interview conducted, one with both parents)Identified as being hesitant | * Parents saw vaccination as important for themselves and their community, despite their limited knowledge of vaccine preventable diseases. The benefits of vaccinating children were also thought to outweigh the risks of refusing.
* Parents reported concerns about potential side effects, and worried about the safety of the MMR and influenza vaccines.
* Concerned about the role of anti-vaccination information in the community, some sought to isolate themselves from parents who did not vaccinate, although others were concerned that this could entrench non-vaccinators' behaviors.
 | Strong |
| Gullion, J.S., 2008 | To explore the attitudes and beliefs of parents who consciously choose not the vaccinate their children and the ways in which they process information on the pros and cons of vaccines | United States (North Texas area) | Unknown | Semi-structured interviews | Unknown | 25 parents (19 mothers; 6 fathers) who did not vaccinate their children | * A desire to collect information on vaccines (about the risks and benefits of vaccines) and trust issues with the medical community were two themes that emerged in the data.
* While parents placed a high value on scientific knowledge, they also expressed high levels of distrust of the medical community.
 | Strong |
| Harmsen, I.A., 2013 | To explore the factors behind parents' decisions to refuse childhood vaccination | Netherlands | 2011 | Online focus group | Thematic analysis | 60 parents39 parents who completely refused vaccination; 21 who partially refused | * Refusal of vaccination was found to reflect multiple factors including family lifestyle and parental perceptions about the body and the immune system of the child; risk perception of diseases and vaccination side effects; perceived vaccine effectiveness; perceived advantages of experiencing the disease; prior negative experiences with vaccination; and social environment.
* Parents who partially or completely refused vaccination reported many similarities in the way they think and make decisions about vaccination, however some differences existed between the two groups such as parents who completely refused vaccination reported having positive experiences with not vaccinating their child(ren).
 | Strong |
| Hilton, S., 2007 | To explore parents’ understandings of vaccine-preventable diseases and the role of first- and second-hand experiences of these diseases in assessments of their severity | United Kingdom (Scotland) | 2002-2003 | Focus groups | Constant comparative method | 66 parents (58 mothers; 8 fathers) | * There were many gaps in parents’ knowledge about some vaccine-preventable diseases which led some parents to question the need for vaccination.
* First-hand experiences of the diseases reinforced the need for vaccination in some cases (e.g. Men C), but undermined it in others (e.g. pertussis, measles, rubella, mumps).
 | Strong |
| Kurup, L., 2017 | To explore the views, concerns and needs of parents regarding their child's vaccination | Singapore | 2015 | Semi-structured interviews | Thematic analysis | 19 parents (9 mothers; 10 fathers) | * Most participants adhered to the recommended vaccination schedule and took up optional vaccinations for their children due to a few factors.
* Factors promoting vaccination uptake included mandatory nature of vaccination in Singapore, trust in health care, desire to protect the child and the community, easy access and availability and fear of consequences of not taking vaccination.
* Factors impeding vaccination compliance included negative experiences and concerns of risks and side effects, scheduling constraints, limited accessibility of optional vaccination and perceived low severity of disease.
 | Strong |
| Miller, N.K., 2008 | To gain insight into parents’ need for information about child immunization | Canada (south of Calgary in the province of Alberta) | 2003 | Semi-structured interviews | Content analysis | 11 mothers 5 mothers have fully immunized their child, while others were varied in their decisions | * Information played a role in mothers' decisions. Others factors influencing their decisions included past experiences of themselves or others; perceived risks of vaccines; not being aware they had a choice with regard to vaccinating; personal beliefs coloring their attitudes and decisions; and relationships with health professionals.
* Mothers' concerns in making their decision included making the right decision; being respected for making a decision and being given all the information.
* Mothers also reported their perceptions about what "good" information was and their information needs.
 | Strong |
| Niederhauser, V.P., 2007 | To explore the barriers to immunizations in parents whose children are not fully immunized by age 2 | United States(Oahu, Kauai, Maui & Hawaii islands) | 2003-2004 | Focus groups | Content analysis | 64 parents, guardians or foster parents (58 females; 6 males) of under- and unimmunized children | * Main barriers to childhood immunizations were related to parental issues, beliefs (such as antivaccine ones), knowledge and fears.
* Organizational barriers, transportation and financial issues and issues related to the child were also reported.
 | Strong |
| Oude Engberink, A., 2015 | To understand parents' representations of immunization based on their own lived experiences and their influence on the influence on decision-making | France (area of Montpellier) | 2013-2014 | Semi-structured interviews | Grounded theory & Semio-pragmatic method (phenomenological approach) | 14 parents (9 mothers; 5 fathers) 3 had vaccinated their children according to the recommendations; 10 had vaccinated their children variably and 1 had refuse vaccines | * Parents are unaware of the diseases for which there are vaccines and express a need for information.
* A perception of the inequality of the individual in face of the disease and the vaccine influences the parents' vaccination decision. It induces in them a reasoned "sifting" of vaccines and leads them to strike a risk/benefit balance.
* Parents trust more in their doctor and their personal experience than in publicized information.
* They perceive the risk as inegal. They also make a selecting in vaccine leading them a balance risks/benefits
 | Strong |
| Reich, J.A., 2014 | To examine the gendered discourse of vaccine refusal | United States(Colorado State) | 2007-2013 | Interviews & ethnographic data | Constructivist Grounded theory | 25 mothers12 have chosen either to refuse recommendedvaccines for their children; 8 selected vaccines and 5 gave all vaccines a on a schedule of their own devising  | * Mothers constantly reassess whether vaccines are necessary for their children, based on shifting perceptions of need and risk.
* They engage in the same processes of assessing risk and benefit from an individualized perspective and sometimes move among categories, based on experience, research, or perceived needs of each child.
* Mothers’ narratives of why they resist vaccine recommendations illustrate how they embrace neoliberal mothering, with goals of individual optimization and consumption, and draw on privilege and access to resources to exercise choice.
* Mothers trust their judgment as mothers more than they trust experts. They conduct research, largely from sources they view as independent from healthcare professionals and, thus, more credible, including friends, family, books, websites, blogs, and listservs committed to intensive mothering or holistic health, and they identify a sense of embodied knowledge, or intuition, as women and mothers.
 | Weak |
| Senier, L., 2008 | To explore how parents assess probabilistic information on vaccine risks and benefits and what may drive them to consider some possible outcomes as worst cases, leading them to deviate from official recommendations  | United States | 2004 | Semi-structured interviews | Content analysis & Grounded theory | 20 parents Having refused, selectively vaccinated or delayed, who had struggled with their decision or who believed one of their children had suffered a vaccine-related adverse event | * Parents employed both probabilistic and possibilistic thinking, but that the contextual factors that influence their interpretation of that information vary.
* Trust is an especially important contextual factor; parents struggling with vaccination decisions describe the importance of trust at multiple levels - in the vaccine, in their doctor, and in the broader public health policy network.
* Parents reported that their decision making was complicated by notions of social responsibility, or the idea that parents should comply with ofﬁcial recommendations to control outbreaks of infectious disease in the public at large.
 | Weak |
| Sobo, E.J., 2016 | To better elucidate how parents deploy the vaccine-related information they have procured, filtered, and made sense of, and to illuminate how parents experience their role in vaccine decision-making | United States (California) | 2014 | Semi-structured interviews | Content analysis  | 53 parents (49 mothers, 4 fathers)33 had fully vaccinated their children; 20 had selectively or not vaccinated their children | * Vaccinating parents saw vaccination as routine while selective and nonvaccinating parents exhibited the type of self-informed engagement that the health care system recommends.
* Selective parents also expressed multiple, sometimes contradictory positions on vaccination that were keyed to individual children's biologies, child size, environmental hazards, specific diseases, and discrete vaccination.
 | Strong |
| Tarrant, M., 2008 | To explore childhood immunizations with a sample of parents from population where children have high vaccination coverage and to identify factors which might encourage uptake in other populations | Hong Kong | Unknown | Semi-structured interviews | Content analysis | 15 parents (14 mothers, 1 father)14 parents had immunized their youngest child according the current immunization guidelines, 1 not | * Core themes identified included individual, family and system factors
* Parents readily admitted knowledge deficits concerning childhood vaccines but believed that the benefits of immunization outweighed the risks.
* Family members and peers were a source of pro-immunization advice and comprehensive public health programs and mandatory vaccination requirements for school entry ensured that childhood immunization recommendations were followed.
 | Strong |
| Vandenberg, S.Y., 2015 | To explore the understanding and decision making of non-immunizing mothers | Canada (south of the province of Alberta) | Unknown | Semi-structured interviews | Grounded theory | 8 mothersAll non-immunizing mothers | * Mothers described the immunization decision-making process as lengthy, difficult, and complex and indicated that the decision was reached not carelessly but purposefully.
* Mothers identified a number of interrelated factors that contribute to immunization decision-making : those could be categorized as emotions (such as fear, negative experiences, guilt, indifference and social belonging), beliefs (religion, natural health beliefs and mistrust), facts (such as factors like lack of exposure to vaccine-preventable diseases, vaccine ingredients, multiple vaccines, vaccine effectiveness) and information (lack of knowledge about and understanding of vaccines).
 | Strong |
| Wang, E., 2015 | To examine how attitudes and beliefs of parents are developed and contribute to immunization decisions, including delaying or spacing vaccines | United States (Philadelphia) | 2010 | Semi-structured interviews | Modified Grounded theory approach | 25 parents (21 mothers; 2 couples)2 declined some vaccines, 9 delayed due extenuating circumstances, 10 deliberately spaced out some vaccines and 14 reported following the ACIP schedule | * Parents who sought out vaccine information often overwhelmed by the quantity and ambiguity when interpreting that information, and, consequently, had to rely on their own instinct or judgment to make vaccine decisions.
* Decision process was informed by a palpable tension between a "scientific" and "non-scientific" approach to decision-making.
* Parents perceived minimal severe consequences for deviating from the recommended immunization schedule.
 | Strong |
| Ward, P.R., 2017 | To explore the ways in which parents who decided not to vaccinate their children talked about perceived risks and benefits incurred by vaccinating (or not vaccinating) their children | Australia (2 cities Fremantle & Adelaide) | Included 2 studies:Fremantle 2013-2014Adelaide 2015 | Semi-structured interviews | Application of deductive social theoretical reasoning with a narrative analysis approach | 29 parents (9 from Fremantle; 20 from Adelaide)13 parents had never vaccinated; 5 commenced but ceased; 7 delaying or partially vaccinating; 4 who had delayed, now up-to-date | * Parents engaged in an ongoing search for information about how best to parent their children, which for many led to questioning/distrust of traditional scientific knowledge.
* Parents practiced health promotion activities which they saw as boosting the natural immunity of their children and protecting them from illness (salutogenic parenting - including breastfeeding, eating organic and/or home grown food, cooking from scratch to reduce preservative consumption and reducing exposure to toxins).
* Parents offered three general and interconnected rationales for their rejection: 1-“capacity”—their perception of their own cognition and abilities to make and keep their child healthy; 2-“knowledge”—their specific engagement with, and trajectory through, the scientific evidence and government recommendations; and 3-“salutogenic parenting”—their comprehensive preventative and health promoting practices which, they believed, replaced the need for vaccines.
 | Strong |
| Ward, P.R., 2017 | To explore the ways in which such parents talk about the perceived risks and benefits incurred by vaccinating (or notvaccinating) their children | Australia (2 cities Fremantle & Adelaide) | Included 2 studies:Fremantle 2013-2014Adelaide 2015 | Semi-structured interviews | Application of deductive social theoretical reasoning with a narrative analysis approach | 29 parents (9 from Fremantle; 20 from Adelaide)12 parents had never vaccinated; 5 commenced but ceased; 7 delaying or partially vaccinating; 5 who had delayed, now up-to-date | * Parents adopted a level of social and personal responsibility (self-trust) to mitigate negative results that might ensue as a consequence of this decision.
* Parents assumed responsibility through salutogenic parenting.
* Parents’ risk management strategies were often constructed very broadly, including restricting children’s exposure to the perceived negative effects of commercialism and technology.
* Given the choice to deviate from the government recommended childhood vaccination schedule, parents accepted and actively took on (and sometimes grappled with) the responsibility for their personal choice.
* Parents attempt to navigate multiple and conflicting ‘risks’: the risk of vaccine-preventable diseases, risks associated with vaccination and risks associated with their own perceived lack of understanding.
* Parents justify the decision and accept the associated ‘responsibility’. Parents use this sense of responsibility to navigate through the ‘responses’ of others
 | Strong |
| Wilson, K., 2008 | To examine and compare the viewpoints of parents who have a spectrum of beliefs about vaccines | Canada(Toronto in the province of Ontario) | 2004 | Focus groups | Content analysis | 33 parents16 parents did not fully vaccinate their children; 8 parents who had their children fully vaccinated but struggled with the decision and 9 who had their children fully vaccinated and who were concerned with parents who did not vaccinate | * The choice to not vaccinate was largely a result of concerns about safety and, to a lesser extent, about lack of effectiveness. These parental views reflected the ability of the coalition concerned about vaccination to challenge parents' trust in traditional public health sources of information.
* The parental decision to vaccinate was due to recognizing the importance of preventing disease and also a consequence of not questioning recommendations from public health and physicians and feeling pressured to because of school policies.
* Variety of levels of belief systems existing amongst parents concerned about vaccination, some more amenable to change than others.
 | Strong |

**Supplementary Table 5. Definitions and illustrations of the theoretical approaches used in included studies**

|  |  |
| --- | --- |
| **Theories** | **Definitions and illustrations** |
| Social theories of risk and trust  | In modern Western societies where a neoliberal approach dominates health care and health promotion, individuals are encouraged to exert autonomy over their own lives, to use available expert knowledge to stay continuously aware of risks and opportunities in their daily life, and to assess risks and benefits in order to make their future secure. This has shifted the traditional locus of power from doctors as sole directors of patient care to shared decision-making between health professionals and parents who want to be active participants in the decision-making process concerning their health and their childs’ health. In addition, while individuals are exhorted to become the “entrepreneur” of their own life [1], they must do so in a context characterized by trust issues, as many — if not all — aspects of our daily lives depend on expert systems that are distant from us and on which we have little control [2]. Vaccination-related issues have not escaped from these structural features of contemporary societies, and in the actual postmodern context that questions the legitimacy of science, expertise and medical authority [3], it is not surprising that more and more individuals question the relevance of vaccination. For instance, Ward et al. argue that contemporary vaccine-refusing parents see engagement with risk assessments as part of the requisite practice of questioning vaccines, undertaken as part of their vigilance in late modernity [4]. |
| Symbolic interactionism  | Symbolic interactionism is a useful perspective for understanding human beings and their behaviors in the world they inhabit and for according their words the greatest importance, which allows for close association with qualitative research [5]. According to this perspective, health and illness are social constructions. Physical conditions have little or no objective reality but instead are considered healthy or ill conditions only if they are defined as such by a group. The symbolic interactionist approach has also provided important studies of the interaction between patients and health-care professionals [6]. In their study of non-vaccinating mothers, Vanderberg and Kulig have shown that the both mothers and healthcare providers were concerned about the health of children, although there were different conclusions about the meaning of health. Mothers had a clear preference for natural health and a high level of distrust in the information provided by healthcare professionals; they believed that healthcare professionals provide biased information. In contrast, healthcare professionals indicated that, although the mothers considered themselves to be well-informed, they were rather misinformed as their source of information as inaccurate or not evidence-based {[7].  |
| Intensive mothering  | Intensive mothering, a phenomenon mostly associated with the decrease of the number of children in families in high-income countries, has been described by Hays in the 1990s as an expert-driven and demanding form of mothering “that advises mothers to expend a tremendous amount of time, energy and money in raising their children” [8]. Different studies have showed how the “intensive” mothers used an instinctive “mother knows best” approach to protect their children’s health, often identifying themselves as uniquely qualified to do so and overruling the authority of medical professionals [9]. The careful use of “good mothering practices” could then gave an impression of control and invulnerability [10] and led intensive mothers to believed vaccines to be less useful for their own child, but still valuable for other children whose mothers were less caring – or even negligent. For instance, in her study of 25 mothers who rejected recommended vaccines, Reich has shown how intensive mothers trusted their judgement as mothers more than they trusted experts on the risks of vaccines and diseases; believed that their own “family’s healthful living” was better than vaccines to keep their children healthy and felt confident to be able to avoid vaccine-preventable diseases by controlling their children’s social networks and exposures to “outsiders” who might infect them [11]. Reich noted that “this neoliberal mothering project, which focuses on one’s own children, allows mothers to ignore how their unvaccinated children benefit from other children’s vaccinations and how their children might present risk to others ” [11]. |
| Salutogenic parenting  | The concept of salutogenic parenting was used in Ward et al. study [12] to refer to parents’ engagement in practices that they believed could equip the child's immune system with general health and resilience. The term draws from Antonovsky to refer to what he saw as the origin of health [13]. According to Ward et al., Antonovsky’s approach is to consider the human system as inherently flawed, with people moving along a continuum from “dis-ease” towards health via “salutary factors”. Salutogenesis requires active participation so that the human body can remain healthy. In Ward et al. study, salutogenic parenting spontaneously arose when parents described their health promoting activities which they saw as boosting the natural immunity of their children and protecting them from illness, which then reduces the need for vaccination. Salutogenic parenting practices identified in Ward et al. study included breastfeeding, eating organic and/or home-grown food, cooking from scratch to reduce preservative consumption and reducing exposure to toxins [12]. |

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