

REVIEW

Resources for assessing parents' vaccine hesitancy: a systematic review of the literature

PAOLA CELLA¹, GIANLUCA VOGLINO², ILARIA BARBERIS³, ENRICO ALAGNA⁴, CLAUDIA ALESSANDRONI⁵, ALESSANDRO CUDA⁶, FRANCESCO D'ALOISIO⁷, GIULIA DALLAGIACOMA⁶, SARA DE NITTO⁸, FRANCESCA DI GASPARE⁵, ORIANA GALLIPOLI⁷, LEANDRO GENTILE⁶, LUCIA KUNDISOV⁹, MONICA NAVARO¹⁰, SANDRO PROVENZANO⁴, OMAR ENZO SANTANGELO⁴, PASQUALE STEFANIZZI⁸, VINCENZA GIANFREDI^{11,12}

¹Post Graduate School of Hygiene and Preventive Medicine, Department of Medicine and Surgery, University of Parma, Italy;

²Post Graduate School of Hygiene and Preventive Medicine, Department of Public Health, University of Turin, Italy; ³Health Science Department, University of Genoa, Italy; ⁴Post Graduate School of Hygiene and Preventive Medicine, Department of Health Promotion, Mother and Child Care, Internal Medicine and Medical Specialties "G. D'Alessandro", University of Palermo, Italy; ⁵Post Graduate School of Hygiene and Preventive Medicine, University of Rome Tor Vergata, Rome, Italy; ⁶Post Graduate School of Hygiene and Preventive Medicine, Department of Public Health, Experimental and Forensic Medicine, University of Pavia, Italy; ⁷Post Graduate School of Hygiene and Preventive Medicine, Department of Life, Health and Environmental Sciences, University of L'Aquila, Italy; ⁸Post Graduate School of Hygiene and Preventive Medicine, Department of Biomedical Science and Human Oncology, University of Bari Aldo Moro, Italy; ⁹Post Graduate School of Public Health, University of Siena, Italy; ¹⁰Post Graduate School of Hygiene and Preventive Medicine, Department of Experimental Medicine, University of Campania "L. Vanvitelli", Italy; ¹¹Post Graduate School of Hygiene and Preventive Medicine, Department of Experimental Medicine, University of Perugia, Italy; ¹²School of Medicine, University Vita-Salute San Raffaele, Milan, Italy

Keywords

Vaccine • Hesitancy • Parents • Questionnaire • Review

Summary

The concept of Vaccine Hesitancy has begun to appear in the scientific landscape, referring to the reluctance of a growing proportion of people to accept the vaccination offer. A variety of factors were identified as being associated with vaccine hesitancy but there was no universal algorithm and currently there aren't any established metrics to assess either the presence or impact of vaccine hesitancy. The aim of this study was to systematically

review the published questionnaires evaluating parental vaccine hesitancy, to highlight the differences among these surveys and offer a general overview on this matter. This study offers a deeper perspective on the available questionnaires, helping future researches to identify the most suitable one according to their own aim and study setting.

Introduction

Vaccines have long been considered as one of the most important public health achievements of the past century and they have largely contributed to the decline in morbidity and mortality related to various infectious diseases [1]. Due to the effectiveness of vaccination programs, many people nowadays have limited or no experience with vaccine-preventable diseases (VPDs), thus parents increasingly assume that the risks associated with VPDs are minimal compared to potential health and safety risks of vaccinations themselves [2, 3]. The concept of Vaccine Hesitancy has subsequently begun to appear in the scientific landscape, referring to the reluctance of a growing proportion of people to accept the vaccination offer [4]. In fact, urban centres with large clusters of vaccine-hesitant individuals are particularly vulnerable to VPD outbreaks among exposed, unimmunized children, as observed with the measles outbreaks in the USA, Canada, and Europe [5-7]. 2014-2015 the Disneyland measles outbreak was a stark reminder of the direct influence of vaccine hesitancy and refusal [8]. The World Health Organization (WHO) defines vaccine hesitancy as the "delay in acceptance or refusal of

vaccines despite availability of vaccination services. Vaccine hesitancy is complex and context specific, varying across time, place and for different vaccines. This phenomenon is influenced by factors such as complacency, convenience and confidence" [9]. The "3Cs" Model, that highlights these three categories, was first proposed in 2011 by the WHO EURO Vaccine Communications Working Group. In the "3 Cs" model, confidence is defined as trust in the effectiveness and safety of vaccines, and in the system that delivers them. This includes the reliability and competence of health services and health professionals and the motivations of policy-makers who decide on the needed vaccines. Vaccination complacency exists where the perceived risks of vaccine-preventable diseases are low and vaccination is not deemed a necessary preventive action. Vaccination convenience is a significant factor when physical availability, affordability, willingness-to-pay, geographical accessibility, ability to understand (language and health literacy) and appeal of immunization services affect the vaccination uptake [10]. There is a wide variety of determinants of vaccine hesitancy. In 2015, the WHO EURO Vaccine Communications Working Group developed the Vaccine Hesitancy

Determinants Matrix which categorized determinants into the following groups: contextual, individual and group influences, and vaccine and vaccination-specific issues [11]. Contextual influences include historic, social, cultural, environmental, economic, political and institutional factors which might influence vaccine hesitant populations. The most common is conspiracy theories, which include a fear that vaccines are introduced to serve the economic and/or political interests of pharmaceutical companies [12, 13].

Individual and group influences include personal perceptions or beliefs about vaccines and influences from the social environment such as the belief that vaccines are unsafe. Parents are more afraid of the adverse events related to vaccines, which are thought to be more frequent and more serious than they really are, than of the complications that could arise from infectious diseases [14]. Moreover, some individuals do not perceive a medical need for certain vaccines. Vaccine Hesitancy is a global, complex and constantly changing phenomenon, currently representing one of the most significant problems of public health: in 2019 the World Health Organization (WHO) listed vaccine hesitancy in its top ten threats to global health [15]. To understand the impact that the various determinants have on vaccine hesitancy and what factors can influence vaccination decisions, numerous studies have been conducted over the years [16, 17].

Despite the growing number of articles on vaccine hesitancy published in recent years, there are some discrepancies among publications in terms of what exactly falls under the umbrella of “vaccine hesitancy”, a term that was only introduced by the SAGE Working Group in 2015. Therefore, in order to obtain as much information as possible on this issue, all studies investigating the determinants of vaccine hesitancy, without specifically using the term “vaccine hesitancy”, were also included in this review. A variety of factors were identified as being associated with vaccine hesitancy but there was no universal algorithm and currently there aren't any established metrics to assess either the presence or impact of vaccine hesitancy. Study methods used to measure “vaccine hesitancy” are too heterogeneous and this makes it difficult to make inferences about the influence of specific factors on vaccine-hesitant behaviour. The aim of this study was to systematically review the published questionnaires evaluating parental vaccine hesitancy, to highlight the differences among these surveys and offer a general overview on this matter. Administration channel, sample size, type of vaccine being investigated, and the type of questions used in the questionnaire are some of the variables that can be considered, when designing a study to investigate vaccine hesitancy. The characteristics of each study, as well as the variables investigated, have been analyzed in order to enable future researchers to choose the most suitable tool for evaluating and measuring vaccine hesitancy over time and in different settings, according to their own needs and goals.

Methods

SEARCH STRATEGY

This is a systematic review conducted in accordance with the PRISMA Guidelines [18]. Several databases were consulted, including PubMed/Medline, Web of Science and The Cochrane Library. The latter was used to identify existing systematic reviews with a similar objective, in order to further screen the lists of references of potentially related articles that might have not been retrieved in the other databases. The systematic search was performed with no time filter, from inception to December 14th, 2017; however, a language limit was adopted, indeed only English and Italian articles were included in our review. The predefined search strategy that was used to identify potential relevant articles included four main aspects: parents or caregivers, vaccine hesitancy/acceptance, immunization and survey. Mesh and text words were combined with Boolean operators AND and OR. The full search strategy is: ((((((questionnair*[Title/Abstract] OR survey[Title/Abstract] OR “Surveys and Questionnaires”[Mesh])) AND (vaccin*[Title/Abstract] OR immuniz*[Title/Abstract] OR immunis*[Title/Abstract] OR shot*[Title/Abstract] OR jab*[Title/Abstract] OR “Vaccines”[Mesh] OR “Immunization”[Mesh] OR “Vaccination”[Mesh])) AND (hesitanc*[Title/Abstract] OR doubt*[Title/Abstract] OR concern*[Title/Abstract] OR criticis*[Title/Abstract] OR rumo*r[Title/Abstract] OR sceptic*[Title/Abstract] OR fear*[Title/Abstract] OR refus*[Title/Abstract] OR reject*[Title/Abstract] OR delay[Title/Abstract] OR accept*[Title/Abstract] OR consen*[Title/Abstract] OR intent*[Title/Abstract] OR confidence[Title/Abstract] OR adherence[Title/Abstract] OR complian*[Title/Abstract] OR uptake[Title/Abstract] OR engagement[Title/Abstract] OR *trust[Title/Abstract] OR a*titude[Title/Abstract] OR perception*[Title/Abstract] OR opinion*[Title/Abstract] OR belief*[Title/Abstract] OR behavi*r[Title/Abstract] OR choice*[Title/Abstract] OR practic*[Title/Abstract] OR barrier*[Title/Abstract] OR facilitator*[Title/Abstract] OR “Health Knowledge, Attitudes, Practice”[Mesh] OR “Vaccination Refusal”[Mesh] OR “Trust”[Mesh] OR “Behavior”[Mesh] OR “Patient Acceptance of Health Care”[Mesh])))) AND (parent*[Title/Abstract] OR caregiver*[Title/Abstract] OR guardian*[Title/Abstract] OR tutor*[Title/Abstract] OR mother*[Title/Abstract] OR father*[Title/Abstract] OR “legally acceptable representative”[Title/Abstract] OR “Parents”[Mesh])). In order to include all publications related to the topic, the list of references was manually screened for all relevant papers. Endnote was used as a software to manage all the retrieved references.

INCLUSION CRITERIA

Studies that fulfilled the inclusion criteria were considered in this review. Papers aimed at investigating parents/caregivers vaccine hesitancy through a survey/

questionnaire were considered eligible, regardless of the attitudes and behaviours of the interviewed subjects. As a matter of fact, vaccine hesitancy is complex and driven by a wide variety of factors, as explained by the 3C model developed by the SAGE Working Group. Therefore, knowing the determinants of Vaccine Hesitancy in specific subgroups of parents (such as those who do not trust or have lost confidence in vaccinations) is extremely important in order to develop the right strategies to address it. In addition, including studies selecting the study population according to a negative/positive attitude/behaviour towards vaccination might be helpful for future researchers interested in studying Vaccine Hesitancy in a specific subgroup of parents. Because vaccine hesitancy is a complex phenomenon, strictly depending on several aspects that are country-specific, and because the introduction of vaccine hesitancy as a term in the scientific community is relatively new, we also included studies evaluating public trust/distrust, perceptions, concerns, confidence, attitudes, beliefs about vaccines and vaccination programs. Moreover, we included all types of available vaccines. Furthermore, we only assessed original articles, while other types of publications were not included in the analysis. Lastly, due to the aim of the research, only observational studies were considered: along with cross-sectional studies, we included cohort studies and case-control studies. The last two types of studies are particularly helpful in order to obtain as much information as possible and to have a broader overview of this phenomenon: as a matter of fact, they allowed us to include studies where questionnaires or surveys were used to investigate vaccine hesitancy among parents.

EXCLUSION CRITERIA

Studies were excluded from this review when they investigated vaccine hesitancy in target populations different from parents/caregivers/guardians, for instance physicians, educators, or directly the adolescents. Papers written in languages other than English and Italian were excluded, as well as not original articles (reviews, letters to editor, conference papers, editorials). Additionally, surveys aimed at assessing aspects different than vaccine hesitancy were not included. Lastly, articles were excluded if the vaccines examined were not for humans or were not commercially available yet (such as the HIV vaccine), or if the publications were on vaccine development.

DATA EXTRACTION

Eight couples of reviewers (VG and CA, MN and GV, SP and FD, OG and IB, EA and SDN, OES and LK, OG and AC, FDG and LG), independently performed the screening of titles and abstracts, followed by data extraction of the included articles. Disagreement was solved through a discussion between the authors, if disagreement persisted a third author was consulted (PC). Full-texts were downloaded and consulted only for the included articles. The extracted data were reported in a predefined, ad hoc spreadsheet elaborated

in Excel. For each included article, the following items were evaluated: first author's name and year of publication, when and where the study was conducted, study design and study aim, population characteristics and sample size, types of survey and administration, if the questionnaire was previously validated and if it was attached to the manuscript, number and type of questions, type of vaccine analysed, immunization behaviour and beliefs about vaccines.

DATA CODING

The included articles were coded by study period, country, language, study type and study aim, population characteristics, way of administration, number of items and items categories in the questionnaire, types of vaccine, immunization behaviour, beliefs about vaccine safety/efficacy. Regarding the latter, beliefs were coded as follows: i) no assessment of perceived safety/efficacy vaccines; ii) the assessment was performed and most of the respondents believe vaccinations to be safe/effective; iii) the assessment was performed and most of the respondents do not believe vaccinations to be safe/effective; iv) the assessment was performed but data were not available; v) the assessment was performed, but only qualitative and descriptive data were available (numerical data not available). As for the immunization behaviour, it was classified as follows: i) "acceptance", if the whole population consisted of people receiving the vaccination; ii) "refusal", if the whole population consisted of parents refusing the vaccination; iii) "hesitancy/scepticism/doubt", if the population consisted of both parents accepting the vaccine and parents refusing it; iv) if no information was available, it was considered as missing data.

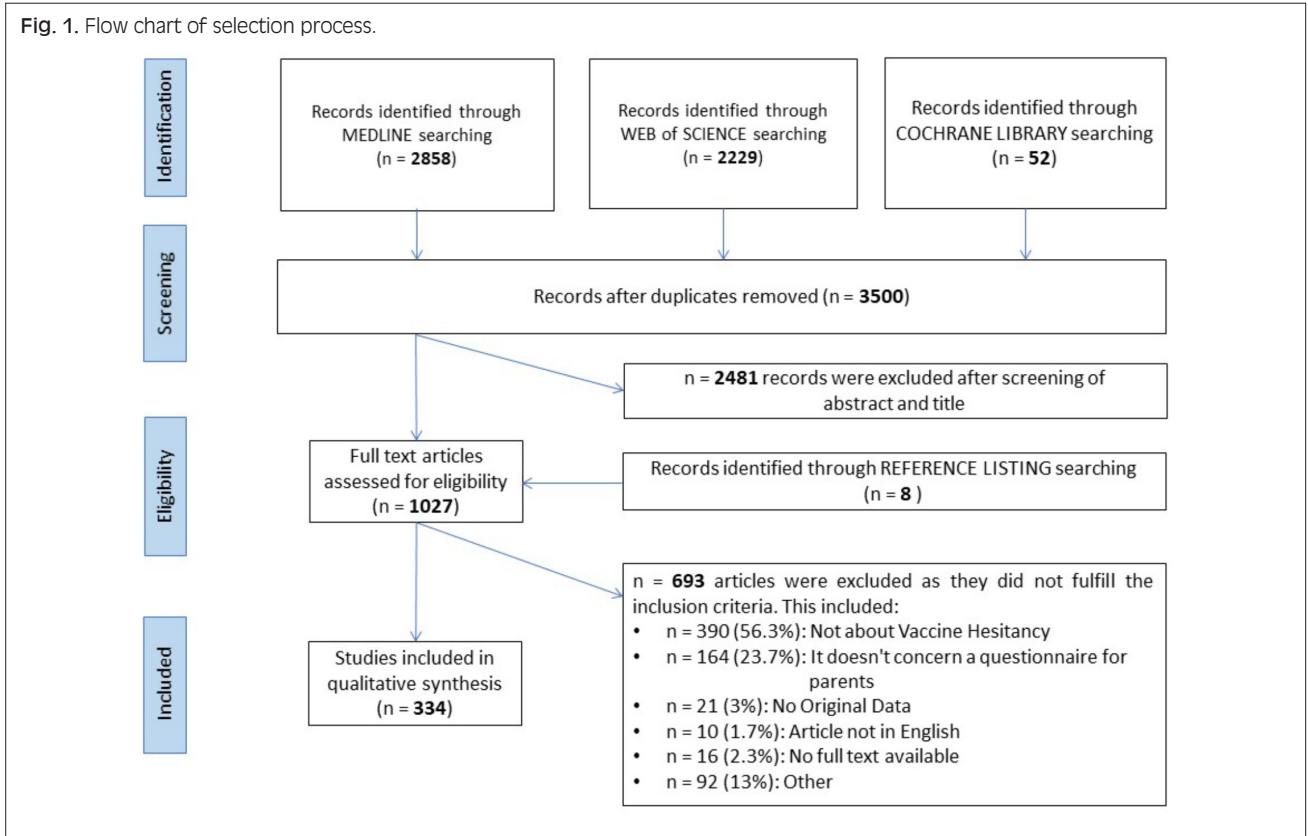
Results

We identified 5,139 records by running the pre-defined search strategies on the three selected databases (Medline, Web of Science, The Cochrane Library), and 8 additional records were retrieved from the manual searching of reference lists and citation chains of included papers. After removing duplicates, 3,500 papers were assessed for eligibility by title and abstract, and 2,481 papers were removed. After full text screening selection, 334 studies were included in the descriptive analysis and synthesis [3, 16, 19-350]. Figure 1 shows the selection flow. The main results of our systematic review are shown in Table I.

STUDY DESIGNS AND STUDY AIMS

Most of the included studies (60.4%, $n = 202/334$) were conducted between 2010 and 2019, while 30.5% ($n = 102/334$) articles reported a study period prior to 2008. In a total of 8.9% ($n = 30/334$) works the study period was not specified. Among the most recent studies, 48.8% ($n = 100/334$) were conducted in North or South America (Argentina, Brazil, Canada, Caribbean, El

Fig. 1. Flow chart of selection process.



Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|---------------------|--------------|--------------|-----------------|------------------------|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| Adler A, 2007 | 2007 | Israel | Cross-sectional | Paper-based | 1,474 | Varicella | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Adorador A, 2011 | 2011 | USA | Cross-sectional | Paper-based | 108 | Dtp | Closed | Not | Hesitancy/scepticism/doubt |
| Aharony N, 2017 | 2017 | Israel | Cross-sectional | On-line | 200 | Child vaccines | Likert scale | With statistical methods | Refusal |
| Akis S, 2011 | 2011 | Turkey | Cross-sectional | Paper-based | 611 | Flu | Closed | Not | Acceptance |
| Akmatov MK, 2009 | 2009 | Kyrgyzstan | Cross-sectional | Paper-based | 934 | Child vaccines | Closed | Not | Acceptance |
| Alberts CJ, 2017 | 2017 | Netherlands | Cross-sectional | Mail | 1,309 | Hpv | Closed | Statistical methods not reported | Acceptance |
| Alfredsson R, 2004 | 2004 | Sweden | Cross-sectional | Paper-based | 300 | Mmr | Closed | With statistical methods | Acceptance |
| Allen JD, 2010 | 2010 | USA | Cross-sectional | On-line | 476 | Hpv | Closed | Not | Acceptance |
| Allison MA, 2010 | 2010 | USA | Cross-sectional | Paper-based | 259 | Flu | Likert scale | With statistical methods | Hesitancy/scepticism/doubt |
| Allred NJ, 2005 | 2005 | USA | Cross-sectional | Mail | 7,810 | Dt | Closed | With statistical methods | Acceptance |
| Alshammari TM, 2018 | 2018 | Saudi Arabia | Cross-sectional | Paper-based | 467 | Child vaccines | Closed | Statistical methods not reported | Acceptance |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|---------------------------|--------------|---------------|-----------------|------------------------|-------------|-------------------|-------------------|----------------------------------|----------------------------|
| Ambe JP, 2001 | 2001 | Nigeria | Cross-sectional | Paper-based | 500 | Measles | Closed | Statistical methods not reported | Refusal |
| Aharon AA, 2017 | 2017 | Israel | Cross-sectional | Paper-based | 731 | Hbv/dtp/mmr | Likert scale | Not | Refusal |
| Arrossi S, 2012 | 2012 | Argentina | Cross-sectional | Paper-based | 1,200 | Hpv | Closed | With statistical methods | Acceptance |
| Azizi FSM, 2017 | 2017 | Malesya | Cross-sectional | Paper-based | 545 | Child vaccines | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Baglioni A, 2014 | 2014 | Italy | Cross-sectional | Paper-based | 648 | Hpv | Closed | With statistical methods | Acceptance |
| Bakhache P, 2013 | 2013 | Multinational | Cross-sectional | On-line | 2,460 | Menb | Closed | Statistical methods not reported | Acceptance |
| Baldwin AS, 2013 | 2008-2010 | USA | Cross-sectional | Paper-based | 256 | Hpv | Likert scale | With statistical methods | Acceptance |
| Bardenheier B, 2003 | 2000 | USA | Cross-sectional | Paper-based | 648 | Hav | Closed | Not | Acceptance |
| Bardenheier B, 2004 | 2001 | USA | Case-control | Paper-based | 3,586 | Mmr/dtp/hbv | Likert scale | Not | Acceptance |
| Bardenheier BH, 2004 | 1997-1998 | USA | Cross-sectional | Paper-based | 3,552 | Dtp/hib/hbv/polio | Closed | Not | Hesitancy/scepticism/doubt |
| Barnack JL, 2010 | 2006 | USA | Cross-sectional | Mail | 200 | Hpv | Likert scale | Not | Acceptance |
| Barnack-Tavlaris JL, 2016 | 2009 | USA | Cross-sectional | Telephone | 4,666 | Hpv | Closed | Not | Acceptance |
| Bazzano A, 2012 | 2007 | USA | Cross-sectional | Telephone | 197 | Child vaccines | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Bedford H, 2007 | 2004 | UK | Cross-sectional | Paper-based | 859 | New vaccines | Likert scale | Not | Acceptance |
| Beel ER, 2013 | 2010-2012 | USA | Cross-sectional | Paper-based | 511 | Child vaccines | Closed | With statistical methods | Acceptance |
| Ben Natan M, 2011 | 2008 | Israel | Cross-sectional | Paper-based | 103 | Hpv | Likert scale | With statistical methods | Hesitancy/scepticism/doubt |
| Ben Natan M, 2016 | 2015 | Israel | Cross-sectional | Paper-based | 200 | Flu | Likert scale | With statistical methods | Acceptance |
| Ben Natan M, 2017 | 2016 | Israel | Cross-sectional | Paper-based | 200 | Hpv | Likert scale | With statistical methods | Acceptance |
| Berenson AB, 2014 | 2011-2013 | USA | Cross-sectional | Paper-based | 1,256 | Hpv | Closed | With statistical methods | Acceptance |
| Bettinger JA, 2016 | 2011 | Canada | Cross-sectional | Mail | 34 | Flu | Closed | Not | Acceptance |
| Bham SQ, 2016 | 2015 | Pakistan | Cross-sectional | Paper-based | 210 | Polio | Closed | Not | Acceptance |
| Bianco A, 2014 | 2014 | Italy | Cross-sectional | Paper-based | 566 | Hpv | Likert scale | Not | Acceptance |
| Bigham M, 2006 | 2002-2003 | Canada | Cross-sectional | Telephone | 487 | Hbv | Likert scale | With statistical methods | Hesitancy/scepticism/doubt |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|----------------------|--------------|-------------|-----------------|------------------------|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| Alder S, 2015 | 2012 | Argentina | Cross-sectional | Paper-based | 180 | Hpv | Closed | With statistical methods | Acceptance |
| Basu P, 2011 | 2008 | India | Cross-sectional | Paper-based | 522 | Hpv | Closed | Statistical methods not reported | Acceptance |
| Blair A, 1997 | 1997 | Australia | Cross-sectional | Paper-based | 245 | Child vaccines | Open field | Not | Acceptance |
| Blyth CC, 2014 | 2008–2012 | Australia | Cross-sectional | Paper-based | 2,576 | Dtp/hib/hbv | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Bodson J, 2016 | 2013 | USA | Cross-sectional | Paper-based | 119 | Hpv | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Bonanni P, 2001 | 2001 | Italy | Cross-sectional | Paper-based | 300 | Child vaccines | Closed | Not | Acceptance |
| Borena W, 2016 | 2015 | Austria | Cross-sectional | Mail | 439 | Hpv | Closed | Not | Hesitancy/scepticism/doubt |
| Borras E, 2009 | 2003–2004 | Spain | Cross-sectional | Telephone | 630 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| Brabin L, 2006 | 2005 | UK | Cross-sectional | Mail | 317 | Hpv | Mixed | With statistical methods | Hesitancy/scepticism/doubt |
| Brambleby P, 1989 | 1988 | UK | Cross-sectional | Mail | 977 | Mmr | Mixed | Statistical methods not reported | Refusal |
| Breitkopf CR, 2009 | 2007 | Vietnam | Cross-sectional | Paper-based | 139 | Hpv | Closed | Not | Hesitancy/scepticism/doubt |
| Brieger D, 2017 | N.A. | Australia | Cross-sectional | Paper-based | 201 | Mmr | Mixed | Not | Hesitancy/scepticism/doubt |
| Brown B, 2017 | 2015–2016 | USA | Cross-sectional | Paper-based | 200 | Hpv | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Brown KF, 2011 | 2009 | UK | Cross-sectional | Mail | 535 | Mmr | Mixed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Brunson EK, 2013 | 2010 | USA | Cross-sectional | On-line | 196 | Child vaccines | Mixed | With statistical methods | Hesitancy/scepticism/doubt |
| Bults M, 2011 | 2009–2010 | Netherlands | Cross-sectional | Face to face/ mail | 1900 | Flu | Open field | With statistical methods | Refusal |
| Burdette AM, 2014 | 2014 | USA | Cross-sectional | Telephone | 20,000 | Hpv | Closed | With statistical methods | Refusal |
| Busse JW, 2011 | 2010 | Canada | Cross-sectional | Paper-based | 95 | Child vaccines | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Buyuktiryaki B, 2014 | 2010 | Turkey | Cross-sectional | Paper-based | 625 | Flu | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Cacciatore MA, 2016 | 2014–2015 | USA | Cross-sectional | On-line | 2,000 | Measles | Mixed | Not | Hesitancy/scepticism/doubt |
| Campbell H, 2017 | 2015 | UK | Cross-sectional | Face to face | 1,792 | Child vaccines | Mixed | Not | Hesitancy/scepticism/doubt |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|-------------------------|--------------|-------------|-----------------|------------------------|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| Carlos RC, 2011 | N.A. | USA | Cross-sectional | Mail | 937 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Casiday R, 2006 | 2004 | UK | Cross-sectional | Mail | 996 | Mmr | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Cassell JA, 2006 | 2004 | UK | Cross-sectional | Mail | 452 | Mmr | Mixed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Cataldi JR, 2016 | 2015 | USA | Cross-sectional | On-line | 343 | Mmr | Mixed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Chan JY, 2014 | 2012 | Hong Kong | Cross-sectional | Paper-based | 1,285 | Varicella | Mixed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Chaparro RM, 2016 | 2012 | Argentina | Cross-sectional | Paper-based | 77 | Hpv | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Chau JPC, 2017 | 2013 | Hong Kong | Cross-sectional | Paper-based | 623 | Flu | Likert scale | With statistical methods | Hesitancy/scepticism/doubt |
| Chen CH, 2015 | 2011 | Taiwan | Cross-sectional | Mail | 1,300 | Flu | Likert scale | With statistical methods | Hesitancy/scepticism/doubt |
| Chen MF, 2011 | 2009 | Taiwan | Cross-sectional | Paper-based | 2,778 | Flu | Mixed | With statistical methods | Hesitancy/scepticism/doubt |
| Cheruvu VK, 2017 | 2017 | USA | Cross-sectional | Telephone | 21,467 | Hpv | Closed | Not | Refusal |
| Chung YM, 2017 | 2012-2014 | USA | Cross-sectional | On-line | 5,121 | Child vaccines | Mixed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Cipriano JJ, 2018 | 2016 | USA | Cross-sectional | On-line | 75 | Hpv | Mixed | Not | Acceptance |
| Clark SJ, 2016 | 2012 | USA | Cross-sectional | On-line | 1,799 | Hpv | Mixed | With statistical methods | Acceptance |
| Clark SJ, 2016 | 2012 | USA | Cross-sectional | On-line | 1,799 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Clark SJ, 2016 | 2013 | USA | Cross-sectional | On-line | 1,799 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Cockcroft A, 2014 | 2011 | Nigeria | Cross-sectional | Paper-based | 5,257 | Measles | Closed | Not | Acceptance |
| Colon-Lopez V, 2016 | 2013 | Puerto Rico | Cross-sectional | Paper-based | 200 | Hpv | Mixed | Not | Acceptance |
| Colon-Lopez V, 2015 | 2013 | Puerto Rico | Cross-sectional | Paper-based | 200 | Hpv | Mixed | Not | Acceptance |
| Coniglio MA, 2011 | 2008 | Italy | Cross-sectional | Paper-based | 1,500 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| Constantine NA, 2007 | 2006 | USA | Cross-sectional | Telephone | 802 | Hpv | Mixed | Not | Acceptance |
| Cooper Robbins SC, 2011 | 2007 | Australia | Cross-sectional | Paper-based | 169 | Flu | Mixed | Not | Acceptance |
| Costa-Pinto JC, 2017 | 2014-2015 | Australia | Cross-sectional | On-line | 612 | Child vaccines | Mixed | Not | Acceptance |
| Coyne-Beasley T, 2013 | 2008 | USA | Cross-sectional | Telephone | 1281 | Mcv | Mixed | Not | Acceptance |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|--------------------------|--------------|-----------------|-----------------|---|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| Cunningham CJ, 1994 | 1991-1992 | UK | Cross-sectional | Face to face/telephone/mail | 93 | Child vaccines | Mixed | Not | Acceptance |
| Cunningham-Erves J, 2016 | 2012-2013 | USA | Cross-sectional | Paper-based | 242 | Hpv | Likert scale | Not | Acceptance |
| Dahlstrom LA, 2010 | 2007 | Sweden | Cross-sectional | Web /paper based | 13,946 | Hpv | N.A. | With statistical methods | Acceptance |
| Daley MF, 2007 | 2003 | USA | Cross-sectional | Telephone | 472 | Flu | Mixed | Not | Acceptance |
| Danchin MH, 2017 | 2015-2016 | Australia | Cross-sectional | Questionnaire (ipad), follow-up phone surveys | 975 | Child vaccines | Mixed | Not | Acceptance |
| Danis K, 2010 | 2004-2005 | Greece | Cross-sectional | Paper-based | 3,434 | Child vaccines | Mixed | Not | Acceptance |
| Dannetun E, 2007 | 2005 | Sweden | Cross-sectional | Paper-based and online | 1,229 | Hbv | Mixed | Statistical methods not reported | Acceptance |
| Dannetun E, 2005 | 2003 | Sweden | Cross-sectional | Paper-based | 173 | Mmr | Mixed | Not | Refusal |
| Danova J, 2015 | 2013-2014 | Repubblica Ceca | Cross-sectional | Paper-based | 480 | Child vaccines | Closed | Not | Refusal |
| Darden PM, 2013 | 2008-2010 | USA | Cross-sectional | Telephone | | Dtp/mcv/hpv | N.A. | Not | Refusal |
| Davis K, 2004 | 2003 | USA | Cross-sectional | Paper-based | 575 | Hpv | Mixed | Not | Acceptance |
| Dawar M, 2002 | 1999 | Canada | Cross-sectional | Telephone | 191 | Hbv/dtp/hib | Mixed | Not | Acceptance |
| de Courval FP, 2003 | 2000 | Canada | Cross-sectional | Telephone | 663 | Varicella | Mixed | Not | Refusal |
| de Visser R, 2008 | 2008 | UK | Cross-sectional | Paper-based | 353 | Hpv | Likert scale | Not | Acceptance |
| Dempsey AF, 2011 | N.A. | USA | Cross-sectional | Mail | 830 | Hpv | Mixed | Not | Acceptance |
| Dempsey AF, 2015 | 2012-2013 | USA | Cross-sectional | On-line | 54 | Hpv | Mixed | Not | Acceptance |
| Dempsey AF, 2006 | 2009 | USA | Cross-sectional | On-line | 1,178 | Hpv | Likert scale | Not | Acceptance |
| DIAnna Kinder F, 2017 | N.A. | USA | Cross-sectional | Paper-based | 72 | Hpv | Mixed | Not | Refusal |
| Dinh TA, 2007 | 2005 | Vietnam | Cross-sectional | Paper-based | 181 | Hpv | Likert scale | Statistical methods not reported | Acceptance |
| Dorell C, 2014 | 2010 | USA | Cross-sectional | Telephone | 4103 | Hpv | Closed | Not | Hesitancy/scepticism/doubt |
| Dorell C, 2013 | 2010-2011 | USA | Cross-sectional | Telephone | 8,652 | Hpv/dtp/mcv | Closed | Not | Hesitancy/scepticism/doubt |
| Dorell C, 2011 | 2009-2010 | USA | Cross-sectional | Telephone | 20,066 | Hpv/mcv/dtp | Closed | Not | Hesitancy/scepticism/doubt |
| Dube E, 2012 | 2008-2009 | Canada | Cohort | Paper-based | 413 | Rotavirus | Mixed | Not | Acceptance |
| Dube E, 2015 | 2014 | Canada | Cross-sectional | Telephone | 703 | Menb | Likert scale | Statistical methods not reported | Acceptance |
| Dube E, 2017 | 2015 | Canada | Cross-sectional | On-line | 20,13 | Child vaccines | Mixed | Not | Acceptance |
| Dube E, 2016 | 2014 | Canada | Cross-sectional | Telephone | 589 | Child vaccines | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|--------------------------|--------------|-------------|-----------------|------------------------|-------------|-----------------------|-------------------|----------------------------------|----------------------------|
| Ezat SW, 2013 | 2012 | Malesya | Cross-sectional | Not reported | 155 | Hpv | N.A. | Not | Acceptance |
| Ezeanochie MC, 2014 | 2009 | Nigeria | Cross-sectional | Paper-based | 201 | Hpv | Closed | Statistical methods not reported | Acceptance |
| Ezenwa BN, 2013 | 2012 | Nigeria | Cross-sectional | Paper-based | 290 | Hpv | N.A. | Not | Acceptance |
| Farias CC, 2016 | 2015 | Brazil | Cross-sectional | Paper-based | 797 | Hpv | Mixed | Not | Acceptance |
| Flood EM, 2010 | 2009 | USA | Cross-sectional | On-line | 500 | Flu | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Flynn M, 2004 | 1999-2000 | UK | Cohort | Paper-based | 511 | Mmr | Likert scale | Not | Hesitancy/scepticism/doubt |
| Freed GL, 2010 | 2009 | USA | Cross-sectional | On-line | 1,552 | Mmr/varicella/mcv/hpv | N.A. | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Freeman VA, 1999 | 1995 | USA | Cross-sectional | Mail | 247 | Varicella | Closed | Not | Hesitancy/scepticism/doubt |
| Frew PM, 2016 | 2012-2014 | USA | Cross-sectional | On-line | 5,121 | Child vaccines | Closed | Not | Acceptance |
| Frew PM, 2011 | 2009 | USA | Cross-sectional | Not reported | 223 | Flu | Likert scale | Not | Refusal |
| Fry AM, 2001 | 1999-2000 | USA | Case-control | Paper-based | 66 | Hib | Open field | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Fuchs EL, 2016 | 2011-2013 | USA | Cross-sectional | Not reported | 350 | Hpv | Likert scale | Not | Hesitancy/scepticism/doubt |
| Garcia DA, 2014 | 2000 | Colombia | Cross-sectional | Paper-based | 4,802 | Child vaccines | Mixed | Not | Hesitancy/scepticism/doubt |
| Gargano LM, 2013 | 2011 | USA | Cross-sectional | Telephone | 114 | Flu/dtp/mcv/hpv | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Gaudino JA, 2012 | 2004-2005 | USA | Cross-sectional | On-line | 1,588 | Child vaccines | Likert scale | Not | Hesitancy/scepticism/doubt |
| Gefenaite G, 2012 | 2009 | Netherlands | Case-control | Mail | 469 | Hpv | Closed | Not | Hesitancy/scepticism/doubt |
| Gellatly J, 2005 | 2003-2004 | UK | Cross-sectional | Paper-based | 110 | Mmr | Likert scale | Not | Hesitancy/scepticism/doubt |
| Gellin BC, 2000 | 1999 | USA | Cross-sectional | Telephone | 1,600 | Child vaccines | Likert scale | Not | Acceptance |
| Gentile A, 2015 | 2013 | Argentina | Cross-sectional | Not reported | 1,350 | Flu | Likert scale | Not | Hesitancy/scepticism/doubt |
| Gerend MA, 2009 | 2008 | USA | Cross-sectional | Paper-based | 82 | Hpv | Closed | Not | Acceptance |
| Gesser-Edelsburg A, 2016 | 2013 | Israel | Cross-sectional | On-line | 197 | Polio | Open field | Not | Refusal |
| Giambi C, 2014 | 2012 | Italy | Cross-sectional | Mail | 1,738 | Hpv | Mixed | Not | Refusal |
| Gilbert NL, 2016 | 2013 | Canada | Cross-sectional | Telephone | 5,720 | Hpv | Likert scale | Not | Hesitancy/scepticism/doubt |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|---------------------|--------------|---------|-----------------|------------------------|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| Gilkey MB, 2017 | 2014-2015 | USA | Cross-sectional | On-line | 1,484 | Hpv | Closed | Not | Hesitancy/scepticism/doubt |
| Glanz JM, 2013 | 2009-2011 | USA | Cross-sectional | Mail | 854 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| Glenn BA, 2015 | 2009 | USA | Cross-sectional | Telephone | 444 | Hpv | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Gomez Y, 2012 | 2010 | USA | Cross-sectional | Paper-based | 773 | Flu | N.A. | Not | Hesitancy/scepticism/doubt |
| Gottlieb SL, 2009 | 2007 | USA | Cross-sectional | Telephone | 889 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Gowda C, 2013 | 2011 | USA | Cross-sectional | On-line | 79 | Mmr | Likert scale | Not | Hesitancy/scepticism/doubt |
| Grabel M, 2013 | 2012 | USA | Cross-sectional | Paper-based | 129 | Hpv | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Grandahl M, 2014 | 2012 | Sweden | Cross-sectional | Face to face | 25 | Hpv | Open field | Statistical methods not reported | Refusal |
| Grandahl M, 2017 | 2012 | Sweden | Cross-sectional | Paper-based | 200 | Hpv | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Greenberg J, 2017 | 2015 | Canada | Cross-sectional | On-line | 1,121 | Mmr | Likert scale | Statistical methods not reported | Acceptance |
| Greenfield LS, 2015 | 2012 | USA | Cross-sectional | Face to face | 157 | Dtp/mcv/hpv | Mixed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Griebeler M, 2012 | 2010 | USA | Cross-sectional | Paper-based | 102 | Hpv | Likert scale | Statistical methods not reported | Acceptance |
| Guerry SL, 2011 | 2007-2008 | USA | Cross-sectional | Telephone | 509 | Hpv | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Gundogdu Z, 2011 | 2009-2010 | Turkey | Cross-sectional | Paper-based | 300 | Varicella | Likert scale | With statistical methods | Acceptance |
| Gunduz S, 2014 | 2011-2012 | Turkey | Cross-sectional | Paper-based | 285 | Flu | Mixed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Gupta R, 2013 | 2009-2010 | USA | Cross-sectional | Paper-based and online | 381 | Flu | Closed | Not | Hesitancy/scepticism/doubt |
| Gust D, 2005 | 2002 | USA | Cross-sectional | Mail | 697 | Child vaccines | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Gust DA, 2006 | 2004-2005 | USA | Cross-sectional | Telephone | 2,286 | Mmr/dtp/hbv | Closed | Not | Hesitancy/scepticism/doubt |
| Gust DA, 2008 | 2003-2004 | USA | Cross-sectional | Telephone | 3,924 | Child vaccines | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Gust DA, 2005 | 2003 | USA | Cross-sectional | Mail | 642 | Child vaccines | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Gust DA, 2004 | 2001 | USA | Case-control | Mail | 1,477 | Mmr/dtp/hbv | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|----------------------|--------------|-------------|-----------------|------------------------|-------------|---------------------------------------|-------------------|----------------------------------|----------------------------|
| Gust DA, 2003 | 2002 | USA | Cross-sectional | Mail | 1,768 | Child vaccines | Likert scale | Statistical methods not reported | Acceptance |
| Gustafson R, 2005 | 2003 | Canada | Cross-sectional | Telephone | 1,246 | Varicella | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Haesebaert J, 2012 | 2008 | France | Cross-sectional | Face to face | 32 | Hpv | Open field | Statistical methods not reported | Acceptance |
| Hagan D, 2016 | 2013 | Ghana | Cross-sectional | Paper-based | 303 | Child vaccines | Closed | Statistical methods not reported | Acceptance |
| Hagemann C, 2017 | 2009-2011 | Germany | Cross-sectional | Paper-based | 1,998 | Varicella/measles | N.A. | With statistical methods | Hesitancy/scepticism/doubt |
| Hak E, 2005 | N.A. | Netherland | Cross-sectional | Not reported | 283 | Influenza/hbv/bcg | Likert scale | Not | Refusal |
| Hamama-Raz Y, 2016 | 2014 | Israel | Cross-sectional | On-line | 314 | Child vaccines | Likert scale | Not | Acceptance |
| Han K, Zheng H, 2014 | 2010 | China | Cross-sectional | Face to face | 1,530 | Bcg/dtp/polio/mcv/hbv | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Hanley SJ, 2012 | 2010 | Japan | Cross-sectional | Paper-based | 862 | Hpv | Likert scale | Not | Acceptance |
| Hanley SJ, 2014 | 2010 | Japan | Cross-sectional | Paper-based | 54 | Hpv | Likert scale | Not | Acceptance |
| Harmsen IA, 2012 | 2011 | Netherlands | Cross-sectional | Paper-based | 906 | Hbv | Likert scale | Not | Acceptance |
| He L, 2015 | 2013 | China | Cross-sectional | Face to face | 298 | Flu | Open field | Not | Hesitancy/scepticism/doubt |
| Healy CM, 2014 | N.A. | USA | Cross-sectional | Not reported | 401 | Hib/pcv/mcv/flu/hbv/hav/hpv/rotavirus | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Henrikson NB, 2017 | 2013-2015 | USA | Cohort | Telephone | 237 | Child vaccines | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Hertweck SP, 2013 | N.A. | USA | Cross-sectional | On-line | 68 | Hpv | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Hilyard KM, 2014 | 2010 | USA | Cross-sectional | Not reported | 684 | Flu | Closed | Not | Hesitancy/scepticism/doubt |
| Hofman R, 2014 | 2009-2011 | Netherlands | Cohort | Mail | 793 | Hpv | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Hofstetter AM, 2015 | 2011 | USA | Cross-sectional | Face to face | 128 | Flu | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Hon KL, 2016 | N.A. | Hong Kong | Cross-sectional | Paper-based | 3,479 | Flu | N.A. | Not | Hesitancy/scepticism/doubt |
| Hontelez JA, 2010 | N.A. | Netherland | Cross-sectional | Paper-based | 198 | Hbv | Likert scale | Not | Hesitancy/scepticism/doubt |
| Horn L, 2010 | 2008 | USA | Cross-sectional | Paper-based | 325 | Hpv | Likert scale | With statistical methods | Acceptance |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|----------------------|--------------|-------------|-----------------|------------------------|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| How CH, 2016 | 2014 | Singapore | Cross-sectional | Face to face | 200 | Pcv | Likert scale | Not | Hesitancy/scepticism/doubt |
| Hu Y, 2017 | 2014 | China | Cross-sectional | Face to face | 2,772 | Child vaccines | N.A. | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Hwang JH, 2017 | 2014 | South Korea | Cross-sectional | Face to face | 638 | Flu | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Ilter E, 2010 | 2009 | Turkey | Cross-sectional | Face to face | 525 | Hpv | Likert scale | Not | Hesitancy/scepticism/doubt |
| Imburgia TM, 2017 | 2014 | USA | Cross-sectional | On-line | 2,363 | Flu | Likert scale | Not | Hesitancy/scepticism/doubt |
| Impicciatore P, 2000 | 1997 | Italy | Cross-sectional | Face to face | 1,035 | Mmr | Closed | With statistical methods | Acceptance |
| Jani JV, 2008 | 2001 | Mozambique | Cross-sectional | Face to face | 668 | Child vaccines | N.A. | Statistical methods not reported | Acceptance |
| Jaspers L, 2011 | 2009 | Indonesia | Cross-sectional | Face to face | 746 | Hpv | Closed | Not | Acceptance |
| Jessop LJ, 2010 | 2001-2004 | UK | Cohort | Paper-based | 749 | Mmr | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Jolley D, 2014 | 2012 | UK | Cross-sectional | On-line | 89 | Child vaccines | Likert scale | Statistical methods not reported | N.A. |
| Joseph NP, 2012 | 2008-2009 | USA | Cross-sectional | Face to face | 70 | Hpv | Open field | With statistical methods | Hesitancy/scepticism/doubt |
| Joseph NP, 2015 | N.A. | | Cross-sectional | Paper-based | 55 | Hpv | Closed | With statistical methods | N.A. |
| Jung M, 2013 | N.A. | | Cross-sectional | On-line | 639 | Flu | N.A. | Not | Hesitancy/scepticism/doubt |
| Kadis JA, 2011 | 2009 | USA | Cross-sectional | On-line | 496 | Hpv | Closed | Statistical methods not reported | Acceptance |
| Kahn JA, 2009 | 2006-2007 | USA | Cross-sectional | Paper-based | 7,207 | Hpv | Likert scale | With statistical methods | Hesitancy/scepticism/doubt |
| Kalucka SK, 2016 | N.A. | Poland | Cross-sectional | Paper-based | 140 | Child vaccines | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Katz ML, 2012 | 2009 | USA | Cross-sectional | Paper-based | 111 | Hpv | Likert scale | Not | Hesitancy/scepticism/doubt |
| Haesebaert J, 2014 | 2008 | France | Cross-sectional | Paper-based | 99 | Hpv | Open field | With statistical methods | Hesitancy/scepticism/doubt |
| Kaya A, 2017 | 2016 | Turkey | Cross-sectional | Paper-based | 102 | Flu | Mixed | Not | Acceptance |
| Kelley CA, 2015 | N.A. | | Case-control | Paper-based | 229 | Child vaccines | Mixed | Statistical methods not reported | Refusal |
| Kempe A, 2007 | 2003 | USA | Cross-sectional | Telephone | 472 | Flu | Mixed | Statistical methods not reported | Hesitancy/scepticism/doubt |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|-----------------------|--------------|---------------|-----------------|------------------------|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| Kennedy A, 2011 | 2009 | USA | Cross-sectional | Mail | 475 | Child vaccines | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Kennedy A, 2011 | 2010 | USA | Cross-sectional | Mail | 376 | Child vaccines | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Kennedy AM, 2005 | 2002 | USA | Cross-sectional | Mail | 1527 | Child vaccines | Likert scale | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Kepka D, 2015 | 2013 | USA | Cross-sectional | Paper-based | 118 | Hpv | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Kepka D, 2015 | 2013 | USA | Cross-sectional | Paper-based | 67 | Hpv | Mixed | With statistical methods | Hesitancy/scepticism/doubt |
| Kepka DL, 2012 | 2009 | USA | Cross-sectional | Paper-based | 578 | Hpv | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Kester LM, 2013 | 2010 | USA | Cross-sectional | On-line | 501 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Kettunen C, 2017 | N.A. | USA | Cross-sectional | Mail | 84 | Child vaccines | Mixed | Statistical methods not reported | Acceptance |
| Kim KM, 2017 | 2014-2015 | South Korea | Cross-sectional | Paper-based | 200 | Hpv | Mixed | Not | Acceptance |
| Kinder FD, 2016 | N.A. | USA | Cross-sectional | Paper-based | 72 | Hpv | Mixed | Not | Refusal |
| Ko HS, 2015 | N.A. | South Korea | Cross-sectional | Paper-based | 308 | Dtp | Closed | Not | Acceptance |
| Kong KA, 2014 | 2013 | South Korea | Cross-sectional | Telephone | 800 | Hav | Mixed | Statistical methods not reported | Acceptance |
| Krawczyk A, 2015 | 2010 | Canada | Cross-sectional | Mail | 774 | Hpv | Likert scale | Not | Hesitancy/scepticism/doubt |
| Krawczyk A, 2015 | 2010 | Canada | Cross-sectional | Mail | 708 | Hpv | Open field | Not | Refusal |
| Krieger JL, 2011 | N.A. | USA | Cross-sectional | Paper-based | 182 | Hpv | Closed | Not | Acceptance |
| Lavail KH, 2013 | 2010 | USA | Case-control | Mail | 376 | Child vaccines | Likert scale | Not | Acceptance |
| Le Ngoc Tho S, 2015 | 2013 | France | Cross-sectional | Paper-based | 1,270 | Menb | Mixed | With statistical methods | Acceptance |
| Lechuga J, 2012 | N.A. | USA | Cross-sectional | Paper-based | 150 | Hpv | Open field | Not | Acceptance |
| Lee KN, 2017 | 2015-2016 | South Korea | Cross-sectional | Paper-based | 140 | Hpv | Mixed | Not | Acceptance |
| Lee Mortensen G, 2015 | 2013 | Multinational | Cross-sectional | Paper-based | 1,837 | Hpv | Closed | Not | Acceptance |
| Lehmann BA, 2017 | 2015 | Netherlands | Cross-sectional | Paper-based | 1,615 | Child vaccines | Mixed | Not | Acceptance |
| Lewis T, 1988 | 1988 | USA | Cohort | Mail | 2,029 | Dtp | N.A. | Not | N.A. |
| Liao Q, 2016 | 2012-2013 | Hong Kong | Cross-sectional | Telephone | 1,226 | Flu | Mixed | Not | Acceptance |
| Lin CJ, 2006 | 2003-2004 | USA | Cross-sectional | Paper-based | 951 | Flu | Mixed | Not | Acceptance |
| Linam WM, 2014 | 2010-2011 | USA | Cross-sectional | Paper-based | 372 | Flu | Mixed | Not | Acceptance |
| Lindley MC, 2016 | 2013 | USA | Cross-sectional | Mail | 6,676 | Hpv | Mixed | Not | Acceptance |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|------------------------|--------------|--------------|-----------------|------------------------|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| Livni G, 2017 | 2012 | Israel | Cross-sectional | Paper-based | 186 | Flu | Mixed | Statistical methods not reported | Acceptance |
| Loke AY, 2017 | 2010 | Hong Kong | Cross-sectional | Paper-based | 170 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Low MSF, 2017 | 2015-2016 | Singapore | Cross-sectional | On-line | 332 | Flu | Mixed | Statistical methods not reported | Acceptance |
| Luthy KE, 2010 | N.A. | USA | Cross-sectional | Paper-based | 86 | Child vaccines | Mixed | Not | Hesitancy/scepticism/doubt |
| Luthy KE, 2013 | N.A. | USA | Cross-sectional | Paper-based | 801 | Child vaccines | Mixed | Not | Hesitancy/scepticism/doubt |
| Luthy KE, 2009 | N.A. | USA | Cross-sectional | Paper-based | 86 | Child vaccines | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Maayan-Metzger A, 2005 | 2003 | Israel | Case-control | Paper-based | 204 | Hbv | Closed | Not | Hesitancy/scepticism/doubt |
| MacDonald SE, 2014 | N.A. | Canada | Case-control | Mail | 444 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| MacDougall DM, 2016 | 2010-2012 | Canada | Case-control | Paper-based | 722 | Rotavirus | Mixed | Statistical methods not reported | Acceptance |
| Madhivanan P, 2014 | 2010 | India | Cross-sectional | Mail | 797 | Hpv | Likert scale | Not | Acceptance |
| Mameli C, 2014 | 2013 | Italy | Cross-sectional | Paper-based | 1,842 | Menb | Closed | Not | Hesitancy/scepticism/doubt |
| Marlow LA, 2007 | 2006 | UK | Cross-sectional | Paper-based | 684 | Hpv | Mixed | Not | Acceptance |
| Marlow LA, 2007 | 2006 | UK | Cross-sectional | Paper-based | 684 | Hpv | Likert scale | With statistical methods | Acceptance |
| Marshall H, 2014 | 2012 | Australia | Cross-sectional | Paper-based | 966 | Menb | N.A. | With statistical methods | Acceptance |
| Marshall H, 2007 | 2006 | Australia | Cross-sectional | Telephone | 2,002 | Hpv | Closed | With statistical methods | Acceptance |
| Mayet AY, 2017 | 2013 | Saudi Arabia | Cross-sectional | Paper-based | 998 | Flu | Mixed | Not | Hesitancy/scepticism/doubt |
| McCauley MM, 2012 | 2010 | USA | Cross-sectional | Telephone | 690 | Child vaccines | Likert scale | Statistical methods not reported | N.A. |
| McHale P, 2016 | 2012-2013 | UK | Cross-sectional | Telephone | 47 | Mmr | Open field | Statistical methods not reported | N.A. |
| Melman ST, 1999 | 1995-1997 | USA | Cross-sectional | Paper-based | 1,059 | Child vaccines | Open field | Not | N.A. |
| Meszaros JR, 1996 | N.A. | USA | Cross-sectional | Paper-based | 294 | Pertussis | Mixed | Not | N.A. |
| Michael CA, 2014 | 2012 | Nigeria | Cross-sectional | Paper-based | 48 | Polio | Open field | Not | N.A. |
| Michael CE, 2014 | 2009 | Nigeria | Cross-sectional | Paper-based | 201 | Hpv | Closed | Not | Acceptance |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|-------------------------|--------------|------------------|-----------------|------------------------|-------------|---|-------------------|----------------------------------|----------------------------|
| Middleman AB, 2002 | 2000 | USA | Cross-sectional | Paper-based | 563 | Hbv | Closed | Not | Hesitancy/scepticism/doubt |
| Milteer RM, 1996 | 1991-1994 | USA | Cross-sectional | Paper-based | 175 | Child vaccines | Open field | Not | N.A. |
| Morales-Campos DY, 2017 | 2011-2013 | Cameron | Cross-sectional | Paper-based | 317 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Morhason-Bello IO, 2015 | 2012 | Nigeria | Cross-sectional | Paper-based | 1,002 | Hpv | Likert scale | With statistical methods | Acceptance |
| Morrone T, 2017 | 2015 | Italy | Cross-sectional | Paper-based | 543 | Menb | N.A. | With statistical methods | N.A. |
| Moulsdale P, 2017 | 2014 | UK | Cross-sectional | Paper-based | 86 | Flu | Likert scale | Not | Acceptance |
| Muhwezi WW, 2014 | 2012 | Uganda | Cross-sectional | Paper-based | 870 | Hpv | Closed | With statistical methods | Acceptance |
| Murakami H, 2014 | 2007 | Pakistan | Cross-sectional | Paper-based | 630 | Polio | Open field | Not | Refusal |
| My C, 2017 | 2012 | Australia | Cross-sectional | On-line | 452 | Flu | Closed | Not | Hesitancy/scepticism/doubt |
| Naeem M, 2011 | 2010 | Pakistan | Cross-sectional | Paper-based | 548 | Polio | Closed | Not | Hesitancy/scepticism/doubt |
| Naeem M, 2011 | 2010 | Pakistan | Cross-sectional | Paper-based | 506 | Hbv | Closed | Not | Hesitancy/scepticism/doubt |
| Namuigi P, 2005 | 2003 | Papua New Guinea | Cross-sectional | Paper-based | 120 | Measles | Closed | Not | Hesitancy/scepticism/doubt |
| Niederhauser VP, 2007 | 2003-2004 | USA | Cross-sectional | Paper-based | 64 | Child vaccines | Open field | Not | Hesitancy/scepticism/doubt |
| Oladokun RE, 2010 | 2009 | Nigeria | Cross-sectional | Paper-based | 248 | Bcg/polio/dtp/masles/hbv | Closed | Statistical methods not reported | Acceptance |
| Onnela JP, 2016 | 2012 | India | Cohort | Paper-based | 2,462 | Polio | Closed | Statistical methods not reported | Acceptance |
| Oria PA, 2013 | 2010 | Kenya | Cross-sectional | Paper-based | 7,177 | Flu | Mixed | Not | N.A. |
| Ozawa S, 2017 | 2013 | Nigeria | Cross-sectional | Paper-based | 198 | Dtp/measles/polio | Closed | Statistical methods not reported | N.A. |
| Paek HJ, 2015 | 2014 | South Korea | Cross-sectional | Paper-based | 1,017 | Child vaccines | Mixed | Not | N.A. |
| Painter JE, 2011 | 2009 | USA | Cross-sectional | Paper-based | 102 | Flu | Mixed | Not | N.A. |
| Parrella A, 2013 | 2011 | Australia | Cross-sectional | Telephone | 469 | Child vaccines | Likert scale | Not | N.A. |
| Parrella A, 2012 | 2010 | New Zeland | Cross-sectional | Telephone | 179 | Dtp/polio/hbv/hib/rotavirus/mmr/mcv/pcv/flu | Closed | Statistical methods not reported | N.A. |
| Paulussen TG, 2006 | 1999 | Netherland | Cross-sectional | On-line | 491 | Dtp/polio/hib/mmr | Closed | Not | N.A. |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|---------------------|--------------|-------------|-----------------|--------------------------------|-------------|--|-------------------|----------------------------------|----------------------------|
| Peleg N, 2015 | 2011 | Israel | Cross-sectional | Paper-based | 273 | Flu | Closed | Statistical methods not reported | N.A. |
| Pelucchi C, 2010 | 2008 | Italy | Cross-sectional | Paper-based | 3,026 | Hpv | N.A. | Not | N.A. |
| Perez S, 2016 | N.A. | Canada | Cross-sectional | On-line | 2,272 | Hpv | Closed | Statistical methods not reported | N.A. |
| Perez S, 2017 | 2014 | Canada | Cross-sectional | On-line | 2,272 | Hpv | Closed | With statistical methods | N.A. |
| Perez S, 2016 | 2014 | Canada | Cross-sectional | On-line | 2,272 | Hpv | Closed | Statistical methods not reported | N.A. |
| Perez S, 2016 | 2014 | Canada | Cross-sectional | On-line | 2,272 | Hpv | Closed | Statistical methods not reported | N.A. |
| Podolsky R, 2009 | N.A. | Usa | Cross-sectional | Paper-based | 308 | Hpv | Mixed | Statistical methods not reported | N.A. |
| Pot M, 2017 | 2015-2016 | Netherlands | Cross-sectional | On-line | 8,062 | Hpv | Closed | Not | N.A. |
| Reiter PL, 2013 | 2008-2010 | Usa | Cross-sectional | Mail | 1,951 | Hpv | Mixed | Statistical methods not reported | N.A. |
| Restivo V, 2015 | 2012-2013 | Italy | Cross-sectional | Telephone | 443 | Mmr | Closed | Not | N.A. |
| Roberts JR, 2015 | 2011-2012 | USA | Cross-sectional | Paper-based | 363 | Dtp/mcv/hpv | Closed | Statistical methods not reported | N.A. |
| Robitz R, 2011 | 2007-2008 | USA | Cross-sectional | Telephone | 484 | Hpv | Closed | Statistical methods not reported | N.A. |
| Rogers C, 2014 | N.A. | USA | Cross-sectional | On-line | 51 | Child vaccines | Closed | Not | N.A. |
| Ruffin MT, 2012 | 2006-2008 | USA | Case-control | Telephone | 1,131 | Hpv | Closed | Not | N.A. |
| Salmon DA, 2005 | 2002-2003 | USA | Case-control | Mail | 1,367 | Polio/mmr/v/dtp/hib/hbv | Closed | Not | N.A. |
| Salmon DA, 2009 | N.A. | USA | Case-control | Mail | 963 | Child vaccines | Closed | Not | N.A. |
| Sam IC, 2009 | 2007 | Malaysia | Cross-sectional | Paper-based | 362 | Hpv | Mixed | Not | N.A. |
| Sampson R, 2011 | 2008 | UK | Cross-sectional | I part mail, ii part interview | 7 | Flu | Closed | Not | N.A. |
| Rickert VI, 2015 | 2012-2013 | USA | Cross-sectional | On-line | 501 | Child vaccines/flu/pcv/mmr/varicella/dtp/hav/hbv/hpv/mcv | Closed | Not | N.A. |
| Rose SB, 2012 | 2008-2009 | New Zeland | Cross-sectional | Paper-based | 769 | Hpv | Closed | Not | N.A. |
| Santibanez TA, 2016 | 2011-2012 | USA | Cross-sectional | Telephone | 19,178 | Flu | Closed | Not | Hesitancy/scepticism/doubt |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|----------------------|--------------|---------------|-----------------|------------------------|-------------|-----------------------|-------------------|----------------------------------|----------------------------|
| Saqer A, 2017 | 2017 | Emirati Arabi | Cross-sectional | Paper-based | 400 | Hpv | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Schollin Ask L, 2017 | 2014 | Sweden | Cross-sectional | On-line | 1,063 | Rotavirus | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Schwarz NG, 2009 | 2009 | Gabon | Cross-sectional | Paper-based | 40 | Child vaccines | Closed | Statistical methods not reported | Acceptance |
| Selmouni F, 2015 | 2015 | Marocco | Cross-sectional | Paper-based | 1,312 | Hpv | Open field | Not | Acceptance |
| Sengupta B, 1998 | 1998 | India | Cross-sectional | Paper-based | 656 | Polio | Mixed | Not | Hesitancy/scepticism/doubt |
| Seven M, 2015 | 2015 | Turkey | Cross-sectional | Paper-based | 368 | Hpv | Closed | Not | N.A. |
| Shao SJ, 2015 | 2014 | Caraibi | Cross-sectional | Paper-based | 35 | Hpv | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Shapiro GK, 2016 | 2014 | Canada | Cross-sectional | On-line | 1,427 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Shapiro GK, 2017 | 2016-2017 | Canada | Cross-sectional | On-line | 4,606 | Hpv | Open field | Statistical methods not reported | Acceptance |
| Shawn DH, 1987 | 1986 | Canada | Cross-sectional | Paper-based | 133 | Hib | Closed | Statistical methods not reported | Hesitancy/scepticism/doubt |
| Sheikh A, 2013 | 2012-2013 | Pakistan | Cross-sectional | Paper-based | 1,044 | Polio/tetanus/measles | Closed | Not | Hesitancy/scepticism/doubt |
| Shuaib FM, 2010 | 2008 | Jamaica | Case-control | Paper-based | 285 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| Skinner J, 1995 | 1992 | Australia | Cohort | Mail | 1,004 | Child vaccines | Mixed | Statistical methods not reported | Acceptance |
| Smaibegovic MS, 2003 | 1999 | UK | Case-control | On-line | 129 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| Smith MJ, 2009 | 2009 | USA | Cross-sectional | On-line | 121 | Child vaccines | Mixed | Not | Hesitancy/scepticism/doubt |
| Smith PJ, 2011 | 2009 | USA | Cross-sectional | Telephone | 11,206 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| Smith PJ, 2010 | 2003 | USA | Cross-sectional | Telephone | 2,921 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| Smith PJ, 2006 | 2001-2002 | USA | Cross-sectional | Telephone | 7,695 | Child vaccines | Closed | Not | Hesitancy/scepticism/doubt |
| Smith PJ, 2015 | 2010-2013 | USA | Cross-sectional | Telephone | 19,144 | Measles | Closed | Not | Hesitancy/scepticism/doubt |
| Smith PJ, 2016 | 2010-2014 | USA | Cross-sectional | Telephone | 8,490 | Hpv | Closed | Not | Hesitancy/scepticism/doubt |
| Sohail MM, 2015 | N.A. | Pakistan | Cross-sectional | Paper-based | 200 | Child vaccines | Mixed | Not | Acceptance |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|--------------------------|--------------|---------------|-----------------|------------------------------|-------------|-----------------|-------------------|----------------------------------|----------------------------|
| Songthap A, 2012 | 2012 | Thailandia | Cross-sectional | Paper-based | 664 | Hpv | Closed | Not | Hesitancy/scepticism/doubt |
| Soyer OU, 2011 | 2003 | USA | Cross-sectional | Telephone | 500 | Flu | Mixed | Not | Acceptance |
| Staras SA, 2014 | 2009 | Usa | Cross-sectional | Telephone | 2,422 | Hpv | Closed | Not | Acceptance |
| SteelFisher GK, 2015 | 2013-2014 | Multinational | Cross-sectional | Paper-based | 6,025 | Polio | Closed | Not | Acceptance |
| Stefanoff P, 2010 | 2008-2009 | Multinational | Cross-sectional | Telephone, paper-based, mail | 6,611 | Child vaccines | Mixed | Not | Acceptance |
| Stein Zamir C, 2017 | 2015 | Israel | Cross-sectional | Paper-based | 45 | Child vaccines | Closed | Not | Acceptance |
| Stephenson JD, 1987 | 1986 | Canada | Cross-sectional | Paper-based | 133 | Hib | Closed | Not | Hesitancy/scepticism/doubt |
| Stockwell MS, 2014 | 2007-2008 | USA | Cross-sectional | Paper-based | 705 | Child vaccines | Mixed | Not | Acceptance |
| Strelitz B, 2015 | 2013-2014 | USA | Cross-sectional | Paper-based | 152 | Flu | Likert scale | Not | Hesitancy/scepticism/doubt |
| Stretch R, 2008 | 2007-2008 | UK | Cross-sectional | Paper-based | 651 | Hpv | Likert scale | Statistical methods not reported | Acceptance |
| Suarez-Castaneda E, 2014 | 2011 | El Salvador | Cross-sectional | Paper-based | 2,550 | Child vaccines | Mixed | Not | Acceptance |
| Sundaram SS, 2010 | N.A. | UK | Cross-sectional | Paper-based | 50 | Hpv | Likert scale | Not | Acceptance |
| Tadesse H, 2009 | 2008 | Ethiopia | Case-control | Paper-based | 266 | Child vaccines | Mixed | Statistical methods not reported | Acceptance |
| Tagbo BN, 2014 | 2014 | Nigeria | Cross-sectional | Paper-based | 426 | Polio | Likert scale | With statistical methods | Hesitancy/scepticism/doubt |
| Taiwo L, 2017 | 2015 | Nigeria | Cross-sectional | Paper-based | 379 | Child vaccines | Mixed | Not | Hesitancy/scepticism/doubt |
| Takahashi K, 2014 | 1999-2003 | Japan | Cross-sectional | Paper-based | 120 | Measles | Mixed | Not | Refusal |
| Tam WW, 2015 | 2003 | HongKong | Cross-sectional | Paper-based | 5,617 | Varicella | Likert scale | Not | Acceptance |
| Tan TNQ, 2017 | 2011-2013 | USA | Cross-sectional | Paper-based | 516 | Hpv | Mixed | Not | Acceptance |
| Tang CW, 2011 | 2006-2008 | Taiwan | Cross-sectional | Paper-based | 539 | Child vaccines | Mixed | Statistical methods not reported | Acceptance |
| Taylor JA, 1996 | 1993 | USA | Case-control | Paper-based | 194 | Child vaccines | Likert scale | Statistical methods not reported | Acceptance |
| Taylor JA, 2002 | 1998-2000 | USA | Cross-sectional | Paper-based | 13,520 | Child vaccines | Mixed | Not | Acceptance |
| Thomas T, 2015 | N.A. | Georgia | Cross-sectional | Paper-based | 37 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Thomas TL, 2012 | 2010-2011 | USA | Cross-sectional | Paper-based | 400 | Hpv | Mixed | Not | Hesitancy/scepticism/doubt |
| Thomas TL, 2013 | 2009 | USA | Cross-sectional | Paper-based | 200 | Hpv | Likert scale | Statistical methods not reported | N.A. |

continues

follows

Tab. I. Main characteristics of the included studies.

| Author, year | Study period | Country | Study design | Administration channel | Sample size | Type of vaccine | Type of questions | Validation | Immunization behaviour |
|---------------------------------|--------------|---------|-----------------|------------------------|-------------|---------------------------|-------------------|----------------------------------|----------------------------|
| Thomas TL, 2017 | 2010-2011 | USA | Cross-sectional | Paper-based | 341 | Hpv | Likert scale | Not | Acceptance |
| Thompson EL, 2017 | 2012-2015 | USA | Cross-sectional | Telephone | 59,897 | Hpv | Closed | With statistical methods | Hesitancy/scepticism/doubt |
| Tisi G, 2013 | 2011 | Italy | Cross-sectional | Paper-based | 161 | Hpv | Mixed | Not | Acceptance |
| Taylor, JA, 2000 | 1997-1998 | USA | Cross-sectional | Paper-based | 598 | Varicella | Likert scale | Not | Hesitancy/scepticism/doubt |
| Schwartz B, 2000 | 2000-2001 | USA | Cross-sectional | Telephone | 12,060 | Hbv/dtp/measles/varicella | Mixed | Not | N.A. |
| Streng A, 2010 | 2006-2008 | Germany | Cross-sectional | Paper-based | 1,088 | Varicella | Mixed | Statistical methods not reported | Acceptance |
| Opel DJ, 2011 | 2010 | USA | Cross-sectional | Mail | 228 | Dtp/polio/mmr | Likert scale | Not | Hesitancy/scepticism/doubt |
| World Health Organization, 1997 | 1994 | Italy | Cross-sectional | Face to face | 1,800 | Dtp/polio | Closed | With statistical methods | Hesitancy/scepticism/doubt |

N.A.: not available.

Salvator, Puerto Rico and USA). 14.4% of the studies (n = 48/334) investigated the Asian population (Hong Kong, China, India, Indonesia, Israel, Japan, South Korea, Kyrgyzstan, Malaysia, Pakistan, Saudi Arabia, United Arab Emirates, Singapore, Taiwan, Thailand and Turkey), 12.8% (n = 26/334) the studies were about European people (Italy, Sweden, United Kingdom, Spain, Greece, France, Germany and the Netherlands), and 11.7% (n = 24/334) of the studies the population was from African and Oceanic countries (Cameroon, Ghana, Kenya, Gabon, Nigeria, Uganda, Morocco, Australia and New Zealand). Only 1.9% of the studies (n = 5/334) were carried out in multiple countries and were therefore classified as multinational surveys.

Almost all of the examined studies, 92.8% (n = 310/334), are cross-sectional; 4.8% (n = 16/334) are case-control studies and finally 2.4% (n = 8/334) are cohort studies.

Even though all the studies included in our review aimed at investigating the phenomenon of vaccine hesitancy, each of them focused on specific aspects of this behaviour. In this respect, the main purpose in 30.8% (n = 103/334) of the studies was to investigate parental knowledge, attitudes, practices, beliefs, awareness, concerns and sources of information about childhood vaccinations. In 21.6% (n = 72/334) of the studies the main objective was focused on investigating parents' attitudes towards childhood vaccinations and exploring possible influential or determining factors. 18.6% (n = 62/334) and 15.0% (n = 50/334) of the studies were aimed respectively at identifying the factors associated with the parental decision to vaccinate and at examining the potential

reasons for refusing immunization of their children. In 4.5% (n = 15/334) of the cases, a broad assessment of the vaccine hesitancy phenomenon was specifically investigated.

According to the 3C model, vaccine convenience is determined by physical availability, affordability and willingness-to-pay, geographical accessibility, ability to understand (consisting of both language and health literacy) and appeal of immunization services [9]. Therefore, potential barriers to immunization were also considered in our research and were investigated in 3.6% (n = 12/334) of the studies. Particular attention to the aspect of non-compliance with the vaccination schedule, such as following the correct timing and the complete administration of all the required vaccine doses, was only investigated in 3.3% (n = 11/334) of the analysed studies. Finally, 9 studies (n = 2.7%) explored the various determinants that can condition parental decisions or attitudes towards the immunization of children with pre-existing pathologies or health problems.

POPULATION CHARACTERISTICS

The population interviewed mainly consisted of parents – without any further details (73.1%, n = 244/334) – in approximately 20% of the studies (n = 66/334) the mother was the only parent surveyed, and only 1 study recruited selectively fathers. The sample size ranged from 7 to 59,897, the mean population included was about 1,647 people.

In primary studies, parents were recruited regardless of their attitudes and beliefs in 68.9% of the studies (n = 230/334), while in the remaining 103 articles, the primary

studies selected the population based on their attitude: about 13.5% of the studies (45/334) were conducted in people with a positive attitude of acceptance, 38 studies (11.4%) were conducted among a hesitant population and 20 (6%) selected a population with an attitude of refusal towards vaccines. The definition of “acceptant/hesitant/refusing” behaviour was described in every article considered, and even though the specific characteristics might be slightly different among different studies, we relied on the classification provided by each article to analyse our results. Recruiting parents on the basis of their attitude towards vaccinations was very important in order to analyse the determinants of Vaccine Hesitancy in each different subgroup.

QUESTIONNAIRES CHARACTERISTICS

The Authors reported both the number and the type of items only in 38.0% (n = 127/334) of the included studies. Regarding the type, more than half (37.7%, n = 126/334) consisted of closed questions. Likert scales were the second most common type used in the questionnaires (23.6%, n = 79/334), while open-ended questions were used in 14.9% of the studies (n = 50/334).

Frequently the studies were conducted using a self-reported questionnaire (69.2%, n = 231/334), or interview (28.1%, n = 94/334), while in 2.7% (n = 9/334) of the studies data were collected in a multi-phase study. Considering the questionnaires, they were mainly administered either on paper (41.6%, n = 139/334) or as an online version (13.5%, n = 45/334). Other administration channels were mail, face to face interviews (9.9%, n = 33/334) or telephone interviews (13.5% 45/334).

However, in 80.2% of the studies, the questionnaire was not attached to the paper and for this reason it was not possible to obtain any further information. Lastly, in 42.8% of the studies (n = 143/334) the questionnaire had been previously validated; however, statistical methods were reported only in 14.8% of the sample (n = 51/334); while in 57.2% (n = 191/334) of the papers the questionnaire had not been validated.

VACCINES AND IMMUNIZATION BEHAVIOURS

22.4% (n = 75/334) of the included articles regarded childhood vaccinations in general, without addressing a specific vaccine. The HPV vaccine was the most frequently investigated (39.2%, n = 133/334), followed by influenza (13.5%, n = 47/334), measles (10.8%, n = 36/334) and varicella or varicella containing vaccine (MMRV) (4.5%, n = 15/334). 67.4% (n = 225/334) of the papers assessed the attitude towards one specific vaccine (monovalent or combined): 5.7% (n = 19/334) of the articles assessed attitudes towards polio vaccine, while 6.3% (n = 22/334) assessed HBV vaccine; a lower percentage reported the behaviour towards meningococcal vaccinations (1.7% - n = 6/334 MenB and 3.6% - n = 12/334 quadrivalent vaccine), Hib vaccine, HAV vaccine, rotavirus and BCG vaccination. 7.5% (n = 25/334) of the studies focused on more than

one vaccine, such as diphtheria, tetanus and pertussis vaccination.

Data about the immunization behaviours were reported in 88% of the studies (n = 294/334). In particular, the subjects involved in the studies showed a behaviour defined as “acceptance” in 38.6% studies (38.6%, n = 129/334), as “hesitancy/scepticism/doubt” in 43.4% (n = 145/334) of the studies (and as “refusal” in 6.6% (n = 22/334) of the studies. In 10.5% (n = 35/334) of the studies assessed this information was not detected.

PARENTS' BELIEFS ABOUT VACCINE SAFETY/ EFFICACY

Parents' beliefs about vaccine safety/efficacy were evaluated in most (58.7%; n = 196/334) of the papers included in the review. In particular, 52.4% (n = 175/334) gave a quantitative evaluation, among which 53.7% (n = 94/175) showed that the majority of the sample believed vaccines to be safe and effective, 4.6% of the studies (n = 8/175) showed that the minority of the subjects interviewed believed in vaccine safety/efficacy, while 41.7% (73/175) outlined how the beliefs about vaccines' safety/efficacy are one of the most important barriers in vaccination. Other studies (10.7%, n = 21/196) gave a qualitative and descriptive approach to the issue of “vaccine safety/efficacy”. No information was given in 41.3% of the studies (n = 138/334).

Discussion

This manuscript shows the results of an extensive systematic review conducted using three scientific databases (PubMed/Medline, Web of Science and The Cochrane Library). Out of 3,508 retrieved studies, 334 papers were included in the qualitative evaluation. The inclusion of a great number of relevant studies, of which two thirds have been conducted in the last 10 years, reflects the relevance of this issue nowadays: investigating and therefore understanding the phenomenon of vaccine hesitancy is a necessary step in the process of overcoming it. As a matter of fact, it is extremely important to counteract this attitude, as it might lead to a decrease in vaccination coverage and therefore increase the risk of future epidemics of VPDs. The original papers included in the analysis were mainly studies conducted in western countries, while 1/4 were performed in Asia and 1/7 in Africa and Oceania. Even if all the studies included in the review aimed at exploring VH among parents or guardians, they differ in their study design, overall number of items, context and response formats. Most of the times, three different types of questions were used in the articles examined: closed questions, likert scales questions and open-ended questions (however, a combination of these types of questions was often used as well). Most of studies had a cross-sectional design and were conducted in the last ten years, aimed to investigate parental knowledge, attitudes, practices and beliefs about childhood vaccinations, while only a small percentage (4.5%) investigated the specific

reasons for vaccine hesitancy. Closed questions were the most frequent, mainly through the administration of a self-reported questionnaire, but in most cases it was impossible to get more information about the tool used, because only in 20% of studies the questionnaire was attached to the article.

Closed questions, allowing a quantitative analysis, are a very useful tool although they don't permit to explain with more details the reasons behind VH for vaccine preventable diseases. In fact, it can be defined as "the means for testing objective theories by examining the relationship among variables which in turn can be measured so that numbered data can be analyzed using statistical procedures". On the other hand, a qualitative approach is more likely to use open questions as research tool. Open ended questions don't enable comparisons between different studies but they do provide more detailed information of the issues examined. In fact, a qualitative approach is useful when statistical procedures and numeric data may be insufficient to capture how patients and health care professionals feel about patients' care, enabling researchers to understand the world as another experiences it [351]. Qualitative tools are connected to the way human behavior can be explained, within the framework of the social structures in which that behavior takes place. However, closed questions represent the easiest way to explore a topic and simplify the analysis for the Authors. It should be considered that the way of administration varied among the studies and might have had an impact on the quality of the data generated [352]. Moreover, since questionnaires are a sort of "diagnostic" epidemiological tool, they should be previously validated in order to effectively measure their outcomes [353]. However, only a small percentage of questionnaire had been previously validated in the studies analysed. This aspect should be taken into account, since effectively monitoring VH and identifying beliefs about vaccines is extremely important in order to fully understand the nature of such hesitancy, to compare the phenomenon among countries and over the time, and lastly, to implement the appropriate types of intervention. In addition, only 14.8% of the included studies reported the statistical methods used to validate the questionnaire in detail.

This review shows that the most frequently analysed vaccines are HPV and flu, followed by measles and varicella containing vaccines. They were mainly investigated for the perception about risks and safety, as well for the low vaccine coverages (compared to the WHO target), which is partly due to the reduction in the perceived risk of these diseases [354]. In this perspective, the reinforcement of mandatory vaccination laws in some European countries (e.g. Italy and France) led to an increase in vaccination coverage, mainly because this intervention tackled the complacency component of VH [355, 356]. In Italy, the reinforcement of the mandatory vaccination law dramatically reduced the number of parents who missed the measles vaccination due to definitive informed dissent or unwillingness to attend the appointment [357].

Fathers were specifically investigated only in 1 study included [175] in this review: further studies should investigate this population, in order to determinate possible gender differences in VH definition. It can be speculated that fathers are little involved, by healthcare professionals, in the vaccination decisions of their children. On the contrary, the involvement of both parents could be important in order to recover the confidence of families, which has diminished over time. In this perspective, healthcare professionals should be adequately trained and properly equipped with communication skills to clearly, transparently and comprehensively deal with this problem [358, 359]. Healthcare professionals are the main source of information on the issue of vaccinations, but they are not the only one: parents frequently rely on the information they obtain on the internet, especially regarding vaccinations and the related diseases [360-362].

Before generalizing the results of this review, some limitation should be acknowledged. First, a small percentage of included studies was validated, and the questions identified didn't address all the determinants in the Vaccine Hesitancy Matrix.

Secondly, the findings from studies investigating specific vaccines should not be generalized to all vaccines. Moreover, VH evolves rapidly in time and some determinants could change quickly, not only according to the perception of danger of the diseases reported by media in different countries but also due to other socio-cultural influences. Monitoring the trend is important in order to measure parental VH in time and to better understand parents' concerns and behaviors. Generally speaking, the availability of a good and accurate tool, tested and validated in all settings, and subsequently refined, is necessary to compare the results, to assess the dynamic nature of VH and to develop tailored communication strategies [363-366]. Furthermore, most of the information, especially related to the vaccination status were self-reported and no vaccination cards or Immunization Information System (IIS) were used to verify the information. Healthcare professionals and scientists should be encouraged to use the new technologies, as for instance the IIS, to monitoring both the vaccination coverage and the VH trends [367, 368]. Moreover, according to a recent review, the IIS might greatly improve and counter VH [369].

Nevertheless, a point of strength of this review is the variety of vaccine preventable diseases included. Moreover, to the best of our knowledge, this is the first systematic review that extensively assessed the developed questionnaires aimed to evaluate the parents' VH.

Conclusions

To conclude, VH is a public health challenge as confirmed by the high number of studies and questionnaires retrieved. No questionnaire can be considered the absolute best a priori, but this study offers a deeper perspective on the available questionnaires, therefore

helping future researches to identify the most suitable one according to their own aim and study setting. Further studies monitoring VH should take into account the questionnaires already available in literature, therefore allowing to improve intra- and inter-country comparability among countries and over time, reducing the time waste in developing a new questionnaire, and improving the financial sustainability of research. Moreover, using a validated questionnaire will improve the methodological quality of future studies.

Acknowledgements

The Authors would like to thank the components of the "Vaccine and vaccine hesitancy" working group of the Committee of Medical Residents of the Italian Society of Hygiene and Preventive Medicine.

Funding sources: this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

VG and PC conceived the study, PC, GV, IB, GD, MN, OG, FD, PS, SDN, SP, AC, LG, FDA, FDG, EA, OES, LK, CA, VG performed a search of the literature, drafted and revised the manuscript. GD revised the language. VG and IB revised critically the manuscript. All authors read and approved the last version of the manuscript.

References

- [1] Centers for Disease Control and Prevention (CDC), Ten great public health achievements-United States, 1900-1999. *MMWR Morb Mortal Wkly Rep* 1999;48:241-3.
- [2] Orenstein WA, Douglas RG, Rodewald LE, Hinman AR. Immunizations in the United States: success, structure, and stress. *Health Aff (Millwood)* 2005;24(3):599-6. <https://doi.org/10.1377/hlthaff.24.3.599>.
- [3] Freed GL, Clark SJ, Butchart AT, Singer DC, Davis MM. Parental vaccine safety concerns in 2009. *Pediatrics* 2010;125(4):654-9. <https://doi.org/10.1542/peds.2009-1962>
- [4] McClure CC, Cataldi JR, O'Leary ST. Vaccine Hesitancy: Where We Are and Where We Are Going. *Clin Ther* 2017;39(8):1550-62. <https://doi.org/10.1016/j.clinthera.2017.07.003>
- [5] Patel M, Lee AD, Redd SB, Clemmons NS, McNall RJ, Cohn AC, Gastanaduy PA. Increase in Measles Cases - United States, January 1-April 26, 2019. *MMWR Morb Mortal Wkly Rep* 2019;68(17):402-4. <https://doi.org/10.15585/mmwr.mm6817e1>
- [6] Public Health Agency of Canada. Measles & Rubella Weekly Monitoring Report – Week 20: May 12 to May 18, 2019. 2019 November 2019]; Available from: <https://www.canada.ca/en/public-health/services/publications/diseases-conditions/measles-rubella-surveillance/2019/week-20.html>
- [7] European Center for Diseases Control and prevention, Monthly measles and rubella monitoring report, May 2019. 2019.
- [8] Zipprich J, Winter K, Hacker J, Xia D, Watt J, Harriman K. Center for Disease Control and Prevention, Measles outbreak-California, December 2014-February 2015. *MMWR Morb Mortal Wkly Rep* 2015;64(6):153-4.
- [9] MacDonald NE, Sage Working Group on Vaccine Hesitancy. Vaccine hesitancy: Definition, scope and determinants. *Vaccine* 2015;33(34):4161-4. <https://doi.org/10.1016/j.vaccine.2015.04.036>
- [10] World Health Organization, Report of the SAGE working group on vaccine hesitancy, 2014.
- [11] Larson HJ, Jarrett C, Eckersberger E, Smith DM, Paterson. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007-2012. *Vaccine* 2014;32(19):2150-9. <https://doi.org/10.1016/j.vaccine.2014.01.081>
- [12] Gesser-Edelsburg A, Shir-Raz Y, Green M. Why do parents who usually vaccinate their children hesitate or refuse? General good vs. individual risk. *Journal of Risk Research* 2016;19(4):405-24. <https://doi.org/10.1080/13669877.2014.983947>
- [13] Harmsen IA, Mollema L, Ruiters RA, Paulussen TG, de Melker HE, Kok G. Why parents refuse childhood vaccination: a qualitative study using online focus groups. *BMC Public Health* 2013;13:1183. <https://doi.org/10.1186/1471-2458-13-1183>
- [14] European Centre for Disease Prevention and Control, Rapid literature review on motivating hesitant population groups in Europe to vaccinate. 2015: Stockholm.
- [15] World Health Organization. Ten threats to global health in 2019, WHO/Rada Akbar. 2019 November 2019]; Available from: <https://www.who.int/emergencies/ten-threats-to-global-health-in-2019>.
- [16] Dorell C, Yankey D, Kennedy A, Stokley S. Factors that influence parental vaccination decisions for adolescents, 13 to 17 years old: National Immunization Survey-Teen, 2010. *Clin Pediatr (Phila)* 2013;52(2):162-70. <https://doi.org/10.1177/0009922812468208>
- [17] Smith LE, Amlot, R, Weinman J, Yiend J, Rubin GJ. A systematic review of factors affecting vaccine uptake in young children. *Vaccine* 2017;35(45):6059-69. <https://doi.org/10.1016/j.vaccine.2017.09.046>
- [18] Moher D, Liberati A, Tetzlaff J, Altman DG, Group P Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med* 2009;151(4):264-9, W64. <https://doi.org/10.7326/0003-4819-151-4-200908180-00135>
- [19] Childhood vaccination coverage in Italy: results of a seven-region survey. The Italian Vaccine Coverage Survey Working Group. *Bull World Health Organ* 1994;72(6):885-95.
- [20] Adler A, Herring E, Babilsky H, Gazala E, Cohen A, Levy I. Parent-dependent barriers to varicella immunization in Israel: the importance of adequate information. *Acta Paediatr* 2007;96(3):428-31. <https://doi.org/10.1111/j.1651-2227.2007.00118.x>
- [21] Adorador A, McNulty R, Hart D, Fitzpatrick, JP. Perceived barriers to immunizations as identified by Latino mothers. *Journal of the American Academy of Nurse Practitioners* 2011;23(9):501-8.
- [22] Aharony N, Goldman R. E-health literacy and the vaccination dilemma: an Israeli perspective. *Information Research-an International Electronic Journal* 2017;22 (2).
- [23] Akis S, Velipasoglu S, Camurda AD, Beyazova U, Sahn F. Factors associated with parental acceptance and refusal of pandemic influenza A/H1N1 vaccine in Turkey. *Eur J Pediatr* 2011; 170 (9):1165-72. <https://doi.org/10.1007/s00431-011-1425-6>
- [24] Akmatov M, Mikolajczyk R, Kretzschmar M, Kramer A. Attitudes and beliefs of parents about childhood vaccinations in post-soviet countries: the example of Kyrgyzstan. *The Pediatric infectious disease journal* 2009;28(7):637-40.
- [25] Alberts CJ, van der Loeff MF, Hazeveld Y, de Melker HE, van der Wal MF, Nielen A, El Fakiri, F, Prins N, Paulusse TG. A longitudinal study on determinants of HPV vaccination uptake

- in parents/guardians from different ethnic backgrounds in Amsterdam, the Netherlands. *BMC Public Health* 2017;17(1): 220. <https://doi.org/10.1186/s12889-017-4091-4>
- [26] Alfredsson R, Svensson E, Trollfors B, Borres M. Why do parents hesitate to vaccinate their children against measles, mumps and rubella? *Acta paediatrica* 2004;93(9):1232-7.
- [27] Allison M, Reyes M, Young P, Calame L, Sheng X, Weng H. Parental attitudes about influenza immunization and school-based immunization for school-aged children. *The Pediatric infectious disease journal* 2010;29(8):751-5.
- [28] Allen J, Othus M, Shelton R, Li Y, Norman N, Tom L. Parental decision making about the HPV vaccine. *Cancer epidemiology, biomarkers & prevention: a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology* 2010;19(9):2187-98.
- [29] Allred NJ, Shaw KM, Santibanez TA, Rickert DL, Santoli JM. Parental vaccine safety concerns: results from the National Immunization Survey, 2001-2002. *Am J Prev Med* 2005;28(2): 221-4. <https://doi.org/10.1016/j.amepre.2004.10.014>
- [30] Alshammari TM, Subaiea GM, Hussain T, Moin A, Yusuf KB. Parental perceptions, attitudes and acceptance of childhood immunization in Saudi Arabia: A cross sectional study. *Vaccine* 2018;36(1):23-28. <https://doi.org/10.1016/j.vaccine.2017.11.050>
- [31] Ambe JP, Omotara BA, Mandu Baba M. Perceptions, beliefs and practices of mothers in sub-urban and rural areas towards measles and measles vaccination in Northern Nigeria. *Trop Doct* 2001; 31(2):89-90. <https://doi.org/10.1177/004947550103100211>
- [32] Aharon A, Nehama H, Rishpon S, Baron-Epel O. Parents with high levels of communicative and critical health literacy are less likely to vaccinate their children. *Patient Education and Counseling* 2017;100(4):768-75.
- [33] Arrossi S, Maceira V, Paolino M, Sankaranarayanan R. Acceptability and uptake of HPV vaccine in Argentina before its inclusion in the immunization program: a population-based survey. *Vaccine* 2012;30(14):2467-74. <https://doi.org/10.1016/j.vaccine.2012.01.032>
- [34] Mohd Azizi FS, Kew Y, Moy FM. Vaccine hesitancy among parents in a multi-ethnic country, Malaysia. *Vaccine* 2017;35(22): 2955-61. <https://doi.org/10.1016/j.vaccine.2017.04.010>
- [35] Baglioni A, Ceriale E, Bagnoli A, Mercione A, Nante N, Messina G. Parents' awareness and acceptance of HPV vaccination in Italy. *Ig Sanita Pubbl* 2014;70(5):489-98.
- [36] Bakhache P, Rodrigo C, Davie S, Ahuja A, Sudovar B, Crudup T, Rose M. Health care providers' and parents' attitudes toward administration of new infant vaccines - a multinational survey. *Eur J Pediatr* 2013;172(4):485-92. <https://doi.org/10.1007/s00431-012-1904-4>
- [37] Baldwin AS, Bruce CM, Tiro JA. Understanding how mothers of adolescent girls obtain information about the human papillomavirus vaccine: associations between mothers' health beliefs, information seeking, and vaccination intentions in an ethnically diverse sample. *J Health Psychol* 2013;18(7):926-38. <https://doi.org/10.1177/1359105312445078>
- [38] Bardenheier B, Gonzalez IM, Washington ML, Bell BP, Averhoff F, Massoudi MS, Hyams I, Simard EP, Yusuf H. Parental knowledge, attitudes, and practices associated with not receiving hepatitis A vaccine in a demonstration project in Butte County, California. *Pediatrics* 2003;112(4):e269. <https://doi.org/10.1542/peds.112.4.e269>
- [39] Bardenheier B, Yusuf H, Schwartz B, Gust D, Barker L, Rodewald L. Are parental vaccine safety concerns associated with receipt of measles-mumps-rubella, diphtheria and tetanus toxoids with acellular pertussis, or hepatitis B vaccines by children? *Arch Pediatr Adolesc Med* 2004;158(6):569-75. <https://doi.org/10.1001/archpedi.158.6.569>
- [40] Bardenheier BH, Yusuf HR, Rosenthal J, Santoli JM, Shefer AM, Rickert DL, Chu SY. Factors associated with underimmunization at 3 months of age in four medically underserved areas. *Public Health Rep* 2004;119(5):479-85. <https://doi.org/10.1016/j.phr.2004.07.005>
- [41] Barnack JL, Reddy DM, Swain C. Predictors of parents' willingness to vaccinate for human papillomavirus and physicians' intentions to recommend the vaccine. *Womens Health Issues* 2002;12(1): 28-34. <https://doi.org/10.1016/j.whi.2009.08.007>
- [42] Barnack-Tavlaris JL, Garcini LM, Macera CA, Brodine S, Klohnoff EA. Human Papillomavirus Vaccination Awareness and Acceptability Among U.S.-Born and U.S. Foreign-Born Women Living in California. *Health Care Women Int* 2016;37(4): 444-62. <https://doi.org/10.1080/07399332.2014.954702>
- [43] Bazzano A, Zeldin A, Schuster E, Barrett C, Lehrer D. Vaccine-related beliefs and practices of parents of children with autism spectrum disorders. *Am J Intellect Dev Disabil* 2012;117(3): 233-42. <https://doi.org/10.1352/1944-7558-117.3.233>
- [44] Bedford H, Lansley M. More vaccines for children? Parents' views. *Vaccine* 2007;25(45):7818-23. <https://doi.org/10.1016/j.vaccine.2007.08.057>
- [45] Beel ER, Rench MA, Montesinos DP, Mayes B, Healy CM. Knowledge and attitudes of postpartum women toward immunization during pregnancy and the peripartum period. *Hum Vaccin Immunother* 2013;9(9):1926-31. <https://doi.org/10.4161/hv.25096>
- [46] Ben Natan M, Aharon O, Palickshvili S, Gurman V. Attitude of Israeli mothers with vaccination of their daughters against human papilloma virus. *J Pediatr Nurs* 2011;26(1):70-7. <https://doi.org/10.1016/j.pedn.2009.07.006>
- [47] Ben Natan M, Kabha S, Yehia M, Hamza O. Factors That Influence Israeli Muslim Arab Parents' Intention to Vaccinate Their Children Against Influenza. *J Pediatr Nurs* 2016;31(3):293-8. <https://doi.org/10.1016/j.pedn.2015.12.014>
- [48] Ben Natan M, Midlej K, Mitelman O, Vafiliev K. Intention of Mothers in Israel to Vaccinate their Sons against the Human Papilloma Virus. *J Pediatr Nurs* 2017;33:41-5. <https://doi.org/10.1016/j.pedn.2017.01.001>
- [49] Berenson AB, Laz TH, Hirth JM, McGrath CJ, Rahman M. Effect of the decision-making process in the family on HPV vaccination rates among adolescents 9-17 years of age. *Hum Vaccin Immunother* 2014;10(7):1807-11. <https://doi.org/10.4161/hv.28779>
- [50] Bettinger JA, Greyson D, Money D. Attitudes and Beliefs of Pregnant Women and New Mothers Regarding Influenza Vaccination in British Columbia. *J Obstet Gynaecol Can* 2016;38(11): 1045-52. <https://doi.org/10.1016/j.jogc.2016.08.004>
- [51] Bham S, Saeed F, Shah M. Routine Immunization in Children and Unsatisfactory Polio Campaigns; A Cross Sectional Survey Conducted at Darul Sehat Hospital, Karachi. *Annals Abbasi Shaheed Hospital & Karachi Medical & Dental College* 2016; 21(1):29-36.
- [52] Bianco A, Pileggi C, Iozzo F, Nobile CG, Pavia M. Vaccination against human papilloma virus infection in male adolescents: knowledge, attitudes, and acceptability among parents in Italy. *Hum Vaccin Immunother* 2014;10(9):2536-42. <https://doi.org/10.4161/21645515.2014.969614>
- [53] Bigham M, Remple VP, Pielak K, McIntyre C, White R, Wu W. Uptake and behavioural and attitudinal determinants of immunization in an expanded routine infant hepatitis B vaccination program in British Columbia. *Can J Public Health* 2006; 97(2): 90-5.
- [54] Alder S, Gustafsson S, Perinetti C, Mints M, Sundstrom K, Andersson S. Mothers' acceptance of human papillomavirus (HPV) vaccination for daughters in a country with a high prevalence of HPV. *Oncol Rep* 2015; 33(5):2521-8. <https://doi.org/10.3892/or.2015.3817>
- [55] Basu P, Mittal S. Acceptability of human papillomavirus vaccine among the urban, affluent and educated parents of young girls residing in Kolkata, Eastern India. *J Obstet Gynaecol Res* 2011;37(5):393-401. <https://doi.org/10.1111/j.1447-0756.2010.01371.x>

- [56] Blair A, Davies E, Nebauer M, Pirozzo S, Saba S, Turner C. Why immunise. Care giver understanding of childhood immunisation. *Collegian* 1997;4(3):10-7. [https://doi.org/10.1016/s1322-7696\(08\)60235-8](https://doi.org/10.1016/s1322-7696(08)60235-8)
- [57] Blyth CC, Richmond PC, Jacoby P, Thornton P, Regan A, Robins C, Kelly H, Smith DW, Effler PV. The impact of pandemic A(H1N1)pdm09 influenza and vaccine-associated adverse events on parental attitudes and influenza vaccine uptake in young children. *Vaccine* 2014;32(32):4075-81. <https://doi.org/10.1016/j.vaccine.2014.05.055>
- [58] Bodson J, Warner EL, Kepka D. Moderate Awareness and Limited Knowledge Relating to Cervical Cancer, HPV, and the HPV Vaccine Among Hispanics/Latinos in Utah. *Health Promot Pract* 2016;17(4):548-56. <https://doi.org/10.1177/1524839916640271>
- [59] Bonanni P, Bergamini M. Factors influencing vaccine uptake in Italy. *Vaccine* 2001;20 Suppl 1:S8-12; discussion S1. [https://doi.org/10.1016/s0264-410x\(01\)00284-5](https://doi.org/10.1016/s0264-410x(01)00284-5)
- [60] Borena W, Luckner-Hornischer A, Katzgraber F, Holm-von Laer D. Factors affecting HPV vaccine acceptance in west Austria: Do we need to revise the current immunization scheme? *Papillomavirus Res* 2016;2:173-7. <https://doi.org/10.1016/j.pvr.2016.10.001>
- [61] Borrás E, Domínguez A, Fuentes M, Batalla J, Cardena N, Plasencia A. Parental knowledge of paediatric vaccination. *BMC Public Health* 2009; 9:154. <https://doi.org/10.1186/1471-2458-9-154>
- [62] Brabin L, Roberts SA, Farzaneh F, Kitchener HC. Future acceptance of adolescent human papillomavirus vaccination: a survey of parental attitudes. *Vaccine* 2006;24(16):3087-94. <https://doi.org/10.1016/j.vaccine.2006.01.048>
- [63] Brambleby P, Hanrahan J. Measles immunisation non-acceptance: validation of computer-held records and raising the vaccine uptake at early school age; the Maidstone experience. *Public Health* 1989;103(4):289-94. [https://doi.org/10.1016/s0033-3506\(89\)80042-3](https://doi.org/10.1016/s0033-3506(89)80042-3)
- [64] Breikopf CR, Pearson HC, Dinh TA, Tran BC, Vu T, Phan GA, Ngo QV, Tran VD, Rosenthal SL. Human papillomavirus vaccine decision-making in Da Nang, Vietnam: perceived spousal and adolescent-parent concordance. *Vaccine* 2009;27(17):2367-71. <https://doi.org/10.1016/j.vaccine.2009.02.021>
- [65] Brieger D, Edwards M, Mudgil P, Whitehall J. Knowledge, attitudes and opinions towards measles and the MMR vaccine across two NSW cohorts. *Aust N Z J Public Health* 2017;41(6):641-646. <https://doi.org/10.1111/1753-6405.12720>
- [66] Brown B, Gabra MI, Pellman H. Reasons for acceptance or refusal of Human Papillomavirus Vaccine in a California pediatric practice. *Papillomavirus Res* 2017;3:42-5. <https://doi.org/10.1016/j.pvr.2017.01.002>
- [67] Brown KF, Shanley R, Cowley NA, van Wijgerden J, Toff P, Falconer M, Ramsay M, Hudson MJ, Green J, Vincent CA, Kroll JS, Fraser G, Sevdalis N. Attitudinal and demographic predictors of measles, mumps and rubella (MMR) vaccine acceptance: development and validation of an evidence-based measurement instrument. *Vaccine* 2011;29(8):1700-9. <https://doi.org/10.1016/j.vaccine.2010.12.030>
- [68] Brunson EK. The impact of social networks on parents' vaccination decisions. *Pediatrics* 2013;131(5):e1397-404. <https://doi.org/10.1542/peds.2012-2452>
- [69] Bults M, Beaujean DJ, Richardus JH, van Steenberghe JE, Voeten HA. Pandemic influenza A (H1N1) vaccination in The Netherlands: parental reasoning underlying child vaccination choices. *Vaccine* 2011;29(37):6226-35. <https://doi.org/10.1016/j.vaccine.2011.06.075>
- [70] Burdette AM, Gordon-Jokinen H, Hill TD. Social determinants of HPV vaccination delay rationales: Evidence from the 2011 National Immunization Survey-Teen. *Prev Med Rep* 2014;1:21-6. <https://doi.org/10.1016/j.pmedr.2014.09.003>
- [71] Busse JW, Walji R, Wilson K. Parents' experiences discussing pediatric vaccination with healthcare providers: a survey of Canadian naturopathic patients. *PLoS One* 2011;6(8):e22737. <https://doi.org/10.1371/journal.pone.0022737>
- [72] Buyuktiryaki B, Soyer OU, Erkokoglu M, Dogan A, Azkur D, Kocabas CN, Dallar Y, Tuncer A, Sekerel BE. What a pandemic teaches us about vaccination attitudes of parents of children with asthma. *Vaccine* 2014;32(20):2275-80. <https://doi.org/10.1016/j.vaccine.2014.02.076>
- [73] Cacciatore MA, Nowak G, Evans NJ. Exploring The Impact Of The US Measles Outbreak On Parental Awareness Of And Support For Vaccination. *Health Aff (Millwood)* 2016;35(2):334-40. <https://doi.org/10.1377/hlthaff.2015.1093>
- [74] Campbell H, Edwards A, Letley L, Bedford H, Ramsay M, Yarwood J. Changing attitudes to childhood immunisation in English parents. *Vaccine* 2017;35(22):2979-85. <https://doi.org/10.1016/j.vaccine.2017.03.089>
- [75] Carlos RC, Dempsey AF, Resnicow K, Ruffin M, Patel DA, Straus CM, Vanessa KD. Maternal characteristics that predict a preference for mandatory adolescent HPV vaccination. *Hum Vaccin* 2011;7(2):225-9. <https://doi.org/10.4161/hv.7.2.13691>
- [76] Casiday R, Cresswell T, Wilson D, Panter-Brick C. A survey of UK parental attitudes to the MMR vaccine and trust in medical authority. *Vaccine* 2006;24(2):177-84. <https://doi.org/10.1016/j.vaccine.2005.07.063>
- [77] Cassell JA, Leach M, Poltorak MS, Mercer CH, Iversen A, Fairhead JR. Is the cultural context of MMR rejection a key to an effective public health discourse? *Public Health* 2006;120(9):783-94. <https://doi.org/10.1016/j.puhe.2006.03.011>
- [78] Cataldi JR, Dempsey AF, O'Leary ST. Measles, the media, and MMR: Impact of the 2014-15 measles outbreak. *Vaccine* 2016;34(50):6375-80. <https://doi.org/10.1016/j.vaccine.2016.10.048>
- [79] Chan JY, Leung KM, Tam WW, Lee A. Varicella vaccine uptake and associated factors in children in Hong Kong. *Epidemiol Infect*, 2014; 142(5): 994-1001. <https://doi.org/10.1017/S0950268813001994>
- [80] Chaparro RM, Em Vargas V, Zorzo LR, Genero S, Cayre A. Acceptance of human papillomavirus vaccination and associated factors in the city of Resistencia, Argentina. *Arch Argent Pediatr* 2016;114(1):36-43. <https://doi.org/10.5546/aap.2016.eng.36>
- [81] Chau JPC, Lo SHS, Choi KC, Chau MHK, Tong DWK, Kwong TKY, Thompson DR. Factors Determining the Uptake of Influenza Vaccination Among Children With Chronic Conditions. *Pediatr Infect Dis J* 2017;36(7):e197-e202. <https://doi.org/10.1097/INF.0000000000001550>
- [82] Chen CH, Chiu PJ, Chih YC, Yeh GL. Determinants of influenza vaccination among young Taiwanese children. *Vaccine* 2015; 3(16):1993-8. <https://doi.org/10.1016/j.vaccine.2015.01.032>
- [83] Chen MF, Wang RH, Schneider JK, Tsai CT, Jiang DD, Hung MN, Lin LJ. Using the Health Belief Model to understand caregiver factors influencing childhood influenza vaccinations. *J Community Health Nurs* 2011;28(1):29-40. <https://doi.org/10.1080/07370016.2011.539087>
- [84] Cheruvu VK, Bhatta MP, Drinkard LN. Factors associated with parental reasons for "no-intent" to vaccinate female adolescents with human papillomavirus vaccine: National Immunization Survey - Teen 2008-2012. *BMC Pediatr* 2017;17(1):52. <https://doi.org/10.1186/s12887-017-0804-1>
- [85] Chung Y, Schamel J, Fisher A, Frew PM. Influences on Immunization Decision-Making among US Parents of Young Children. *Matern Child Health J* 2017;21(12):2178-87. <https://doi.org/10.1007/s10995-017-2336-6>
- [86] Cipriano JJ, Scoloveno R, Kelly A. Increasing Parental Knowledge Related to the Human Papillomavirus (HPV) Vaccine. *J Pediatr Health Care* 2018;32(1):29-35. <https://doi.org/10.1016/j.pedhc.2017.06.006>
- [87] Clark SJ, Cowan AE, Filipp SL, Fisher AM, Stokley S. Understanding Non-Completion of the Human Papillomavirus Vaccine Series: Parent-Reported Reasons for Why Adoles-

- cents Might Not Receive Additional Doses, United States, 2012. *Public Health Rep* 2016;131(3):390-5. <https://doi.org/10.1177/003335491613100304>
- [88] Clark SJ, Cowan AE, Filipp SL, Fisher AM, Stokley S. Parent Perception of Provider Interactions Influences HPV Vaccination Status of Adolescent Females. *Clin Pediatr (Phila)* 2016;55(8):701-6. <https://doi.org/10.1177/0009922815610629>
- [89] Clark SJ, Cowan AE, Filipp SL, Fisher AM, Stokley S. Parent HPV vaccine perspectives and the likelihood of HPV vaccination of adolescent males. *Hum Vaccin Immunother* 2016;12(1):47-51. <https://doi.org/10.1080/21645515.2015.1073426>
- [90] Cockcroft A, Usman MU, Nyamucherera OF, Emori H, Duke B, Umar NA, Andersson N. Why children are not vaccinated against measles: a cross-sectional study in two Nigerian States. *Arch Public Health* 2014;72(1):48. <https://doi.org/10.1186/2049-3258-72-48>
- [91] Colon-Lopez V, Toro-Mejias LM, Conde-Toro A, Serra-Rivera MJ, Martinez TM, Rodriguez V, Rios AM, Berdiel L, Villanueva H. Views on HPV and HPV Vaccination: The Experience at a Federal Qualified Clinic in Puerto Rico. *J Health Care Poor Underserved* 2016;27(3):1411-26. <https://doi.org/10.1353/hpu.2016.0126>
- [92] Colon-Lopez V, Quinones V, Del Toro-Mejias LM, Conde-Toro A, Serra-Rivera MJ, Martinez TM, Rodriguez V, Berdiel L, Villanueva H. HPV Awareness and Vaccine Willingness Among Dominican Immigrant Parents Attending a Federal Qualified Health Clinic in Puerto Rico. *J Immigr Minor Health* 2015;17(4):1086-90. <https://doi.org/10.1007/s10903-014-0067-y>
- [93] Coniglio MA, Platania M, Privitera D, Giammanco G, Pignato S. Parents' attitudes and behaviours towards recommended vaccinations in Sicily, Italy. *BMC Public Health* 2011;11:305. <https://doi.org/10.1186/1471-2458-11-305>
- [94] Constantine NA, Jerman P. Acceptance of human papillomavirus vaccination among Californian parents of daughters: a representative statewide analysis. *J Adolesc Health* 2007;40(2):108-15. <https://doi.org/10.1016/j.jadohealth.2006.10.007>
- [95] Cooper Robbins SC, Leask J, Booy R. Parents' attitudes towards the influenza vaccine and influencing factors. *J Paediatr Child Health* 2011;47(7):419-22. <https://doi.org/10.1111/j.1440-1754.2010.01993.x>
- [96] Costa-Pinto JC, Willaby HW, Leask J, Hoq M, Schuster T, Ghazarian A, O'Keefe J, Danchin MH. Parental Immunisation and Attitudes Survey in paediatric hospital clinics and community maternal and child health centres in Melbourne, Australia. *J Paediatr Child Health* 2018;54(5):522-529. <https://doi.org/10.1111/jpc.13790>
- [97] Coyne-Beasley T, Reiter PL, Liberty AC, Ford CA, Miles DR, Brewer NT. Awareness is not enough: the need to increase meningococcal vaccine uptake. *Clin Pediatr (Phila)* 2013;52(5):441-50. <https://doi.org/10.1177/0009922813481847>
- [98] Cuninghame CJ, Charlton CP, Jenkins SM. Immunization uptake and parental perceptions in a strictly orthodox Jewish community in north-east London. *J Public Health Med* 1994;16(3):314-7.
- [99] Cunningham-Erves J, Talbott LL, O'Neal MR, Ivankova NV, Wallston KA. Development of a Theory-based, Sociocultural Instrument to Assess Black Maternal Intentions to Vaccinate Their Daughters Aged 9 to 12 Against HPV. *J Cancer Educ* 2016;31(3):514-21. <https://doi.org/10.1007/s13187-015-0867-3>
- [100] Dahlstrom LA, Tran TN, Lundholm C, Young C, Sundstrom K, Sparen P. Attitudes to HPV vaccination among parents of children aged 12-15 years-a population-based survey in Sweden. *Int J Cancer*, 20 [https://doi.org/10.126\(2\):500-7](https://doi.org/10.126(2):500-7). <https://doi.org/10.1002/ijc.24712>
- [101] Daley MF, Crane LA, Chandramouli V, Beaty BL, Barrow J, Allred N, Berman S, Kempe A. Misperceptions about influenza vaccination among parents of healthy young children. *Clin Pediatr (Phila)* 2007;46(5):408-17. <https://doi.org/10.1177/0009922806298647>
- [102] Danchin MH, Costa-Pinto J, Attwell K, Willaby H, Wiley K, Hoq M, Leask J, Perrett KP, O'Keefe J, Giles ML, Marshall H. Vaccine decision-making begins in pregnancy: Correlation between vaccine concerns, intentions and maternal vaccination with subsequent childhood vaccine uptake. *Vaccine* 2018;36(44):6473-9. <https://doi.org/10.1016/j.vaccine.2017.08.003>
- [103] Danis K, Georgakopoulou T, Stavrou T, Laggas D, Panagiotopoulos T. Socioeconomic factors play a more important role in childhood vaccination coverage than parental perceptions: a cross-sectional study in Greece. *Vaccine* 2010;28(7):1861-9. <https://doi.org/10.1016/j.vaccine.2009.11.078>
- [104] Dannetun E, Tegnell A, Giesecke J. Parents' attitudes towards hepatitis B vaccination for their children. A survey comparing paper and web questionnaires, Sweden 2005; *BMC Public Health* 2007;7:86. <https://doi.org/10.1186/1471-2458-7-86>
- [105] Dannetun E, Tegnell A, Hermansson G, Giesecke J. Parents' reported reasons for avoiding MMR vaccination. A telephone survey. *Scand J Prim Health Care* 2005;23(3):149-53. <https://doi.org/10.1080/02813430510031306>
- [106] Danova J, Salek J, Kocourkova A, Celko AM. Factors Associated with Parental Refusal of Routine Vaccination in the Czech Republic. *Cent Eur J Public Health* 2015;23(4):321-3. <https://doi.org/10.21101/cejph.a4395>
- [107] Darden PM, Thompson DM, Roberts JR, Hale JJ, Pope C, Naifeh M, Jacobson RM. Reasons for not vaccinating adolescents: National Immunization Survey of Teens, 2008-20 <https://doi.org/10.1542/peds.2012-2384>
- [108] Davis K, Dickman ED, Ferris D, Dias JK. Human papillomavirus vaccine acceptability among parents of 10- to 15-year-old adolescents. *J Low Genit Tract Dis* 2004;8(3):188-94. <https://doi.org/10.1097/00128360-200407000-00005>
- [109] Dawar M, Dobson S, Kallos A, LaJeunesse C, Weatherill S, Daly P. Measuring hepatitis B uptake in a new universal infant program. *Can J Public Health* 2002;93(4):281-4.
- [110] de Courval FP, De Serres G, Duval B. Varicella vaccine: factors influencing uptake. *Can J Public Health* 2003;94(4):268-71.
- [111] de Visser R, McDonnell E. Correlates of parents' reports of acceptability of human papilloma virus vaccination for their school-aged children. *Sex Health* 2008;5(4):331-8. <https://doi.org/10.1071/sh08042>
- [112] Dempsey AF, Butchart A, Singer D, Clark S, Davis M. Factors associated with parental intentions for male human papillomavirus vaccination: results of a national survey. *Sex Transm Dis* 2011;38(8):769-76. <https://doi.org/10.1097/OLQ.0b013e318211c248>
- [113] Dempsey AF, Maertens J, Beaty B, O'Leary ST. Characteristics of users of a tailored, interactive website for parents and its impact on adolescent vaccination attitudes and uptake. *BMC Res Notes* 2015;8:739. <https://doi.org/10.1186/s13104-015-1721-8>
- [114] Dempsey AF, Zimet GD, Davis RL, Koutsky L. Factors that are associated with parental acceptance of human papillomavirus vaccines: a randomized intervention study of written information about HPV. *Pediatrics* 2006;117(5):1486-93. <https://doi.org/10.1542/peds.2005-1381>
- [115] DiAnna Kinder F. Parental Refusal of Human Papillomavirus Vaccine: Multisite Study. *J Pediatr Health Care* 2018;32(2):150-6. <https://doi.org/10.1016/j.pedhc.2017.09.003>
- [116] Dinh TA, Rosenthal SL, Doan ED, Trang T, Pham VH, Tran BD, Tran VD, Phan GA, Chu HK, Breitkopf CR. Attitudes of mothers in Da Nang, Vietnam toward a human papillomavirus vaccine. *J Adolesc Health* 2007;40(6):559-63. <https://doi.org/10.1016/j.jadohealth.2007.02.003>
- [117] Dorell C, Yankey D, Jeyarajah J, Stokley S, Fisher A, Markowitz L, Smith PJ. Delay and refusal of human papillomavirus vaccine for girls, national immunization survey-teen, 2010. *Clin Pediatr (Phila)* 2014;53(3):261-9. <https://doi.org/10.1177/0009922813520070>

- [118] Dorell C, Yankey D, Strasser S. Parent-reported reasons for non-receipt of recommended adolescent vaccinations, national immunization survey: teen, 2009. *Clin Pediatr (Phila)* 2011;50(12):1116-24. <https://doi.org/10.1177/0009922811415104>
- [119] Dube E, Bettinger JA, Halperin B, Bradet R, Lavoie F, Sauvageau C, Gilca V, Boulianne N. Determinants of parents' decision to vaccinate their children against rotavirus: results of a longitudinal study. *Health Educ Res* 2012;27(6):1069-80. <https://doi.org/10.1093/her/cys088>
- [120] Dube E, Gagnon D, Hamel D, Belley S, Gagne H, Boulianne N, Landry M, Bettinger JA. Parents' and adolescents' willingness to be vaccinated against serogroup B meningococcal disease during a mass vaccination in Saguenay-Lac-St-Jean (Quebec). *Can J Infect Dis Med Microbiol* 2015;26(3):163-7. <https://doi.org/10.1155/2015/732464>
- [121] Dube E, Gagnon D, Ouakki M, Bettinger JA, Wittman HO, MacDonald S, Fisher W, Saini V, Greyson D, Canadian Immunization Research N. Measuring vaccine acceptance among Canadian parents: A survey of the Canadian Immunization Research Network. *Vaccine* 2018;36(4):545-52. <https://doi.org/10.1016/j.vaccine.2017.12.005>
- [122] Dube E, Gagnon D, Zhou Z, Deceuninck G, Parental Vaccine Hesitancy in Quebec (Canada). *PLoS Curr*, 2016. 8. <https://doi.org/10.1371/currents.outbreaks.9e239605f4d320c6ad27ce2aea5aaad2>
- [123] Ezat SW, Hod R, Mustafa J, Mohd Dali AZ, Sulaiman AS, Azman A. National HPV immunisation programme: knowledge and acceptance of mothers attending an obstetrics clinic at a teaching hospital, Kuala Lumpur. *Asian Pac J Cancer Prev* 2013;14(5):2991-9. <https://doi.org/10.7314/apjcp.2013.14.5.2991>
- [124] Ezeanochie MC, Olagbuji BN. Human papilloma virus vaccine: determinants of acceptability by mothers for adolescents in Nigeria. *Afr J Reprod Health* 2014;18(3):154-8.
- [125] Ezenwa BN, Balogun MR, Okafor IP. Mothers' human papilloma virus knowledge and willingness to vaccinate their adolescent daughters in Lagos, Nigeria. *Int J Womens Health* 2013;5:371-7. <https://doi.org/10.2147/IJWH.S44483>
- [126] Farias CC, Jesus DV, Moraes HS, Buttenbender IF, Martins IS, Souto MG, Goncalves Filho, P.H., Costa, R.M., Silva Sde, O., Ferreira, T.S., Coutinho, V.V., Minotto, H.R., and Fonseca, A.J., Factors related to non-compliance to HPV vaccination in Roraima-Brazil: a region with a high incidence of cervical cancer. *BMC Health Serv Res* 2016;16(1):417. <https://doi.org/10.1186/s12913-016-1677-y>
- [127] Flood EM, Rousculp MD, Ryan KJ, Beusterien KM, Divino VM, Toback SL, Sasane M, Block SL, Hall MC, Mahadevia PJ. Parents' decision-making regarding vaccinating their children against influenza: A web-based survey. *Clin Ther* 2010;32(8):1448-67. <https://doi.org/10.1016/j.clinthera.2010.06.020>
- [128] Flynn M, Ogden, J. Predicting uptake of MMR vaccination: a prospective questionnaire study. *Br J Gen Pract* 2004;54(504):526-30.
- [129] Freeman VA, Freed GL. Parental knowledge, attitudes, and demand regarding a vaccine to prevent varicella. *Am J Prev Med* 1999;17(2):153-5. [https://doi.org/10.1016/s0749-3797\(99\)00063-x](https://doi.org/10.1016/s0749-3797(99)00063-x)
- [130] Frew PM, Fisher AK, Basket MM, Chung Y, Schamel J, Weiner JL, Mullen J, Omer SB, Orenstein WA. Changes in childhood immunization decisions in the United States: Results from 2012 & 2014 National Parental Surveys. *Vaccine* 2016;34(46):5689-96. <https://doi.org/10.1016/j.vaccine.2016.08.001>
- [131] Frew PM, Hixson B, del Rio C, Esteves-Jaramillo A, Omer SB. Acceptance of pandemic 2009 influenza A (H1N1) vaccine in a minority population: determinants and potential points of intervention. *Pediatrics* 2011;127 Suppl 1:S113-9. <https://doi.org/10.1542/peds.2010-1722Q>
- [132] Fry AM, Lurie P, Gidley M, Schmink S, Lingappa J, Fischer M, Rosenstein NE. Haemophilus influenzae Type b disease among Amish children in Pennsylvania: reasons for persistent disease. *Pediatrics* 2001;108(4): E60. <https://doi.org/10.1542/peds.108.4.e60>
- [133] Fuchs EL, Rahman M, Berenson AB. Examining maternal beliefs and human papillomavirus vaccine uptake among male and female children in low-income families. *Papillomavirus Res* 2016;2: 8-40. <https://doi.org/10.1016/j.pvr.2016.02.002>
- [134] Garcia LD, Velandia-Gonzalez M, Trumbo SP, Pedreira MC, Bravo-Alcantara P, Danovaro-Holliday MC. Understanding the main barriers to immunization in Colombia to better tailor communication strategies. *BMC Public Health* 2014;14:669. <https://doi.org/10.1186/1471-2458-14-669>
- [135] Gargano LM, Herbert NL, Painter JE, Sales JM, Morfaw C, Rask K, Murray D., Di Clemente, RJ, Hughes JM. Impact of a physician recommendation and parental immunization attitudes on receipt or intention to receive adolescent vaccines. *Hum Vaccin Immunother* 2013;9(12):2627-33. <https://doi.org/10.4161/hv.25823>
- [136] Gaudino JA, Robison S. Risk factors associated with parents claiming personal-belief exemptions to school immunization requirements: community and other influences on more skeptical parents in Oregon, 2006. *Vaccine* 2012;30(6):1132-42. <https://doi.org/10.1016/j.vaccine.2011.12.006>
- [137] Gefenaite G, Smit M, Nijman HW, Tami A, Drijfhout IH, Pascal A, Postma MJ, Wolters BA, van Delden JJ, Wilschut JC, Hak E. Comparatively low attendance during Human Papillomavirus catch-up vaccination among teenage girls in the Netherlands: Insights from a behavioral survey among parents. *BMC Public Health* 2012;12:498. <https://doi.org/10.1186/1471-2458-12-498>
- [138] Gellatly J, McVittie C, Tiliopoulos N. Predicting parents' decisions on MMR immunisation: a mixed method investigation. *Fam Pract* 2005;22(6):658-62. <https://doi.org/10.1093/fampra/cmi066>
- [139] Gellin BG, Maibach EW, Marcuse EK. Do parents understand immunizations? A national telephone survey. *Pediatrics* 2000;106(5):1097-102. <https://doi.org/10.1542/peds.106.5.1097>
- [140] Gentile A, Juarez M, Hernandez S, Moya A, Bakir J, Lucion M. Influenza vaccine: Delayed vaccination schedules and missed opportunities in children under 2 years old. *Vaccine* 2015;33(32):3913-7. <https://doi.org/10.1016/j.vaccine.2015.06.065>
- [141] Gerend MA, Weibley E, Bland H. Parental response to human papillomavirus vaccine availability: uptake and intentions. *J Adolesc Health* 2009;45(5):528-31. <https://doi.org/10.1016/j.jadohealth.2009.02.006>
- [142] Gesser-Edelsburg A, Shir-Raz Y, Green M. Why do parents who usually vaccinate their children hesitate or refuse? General good vs. individual risk. *Journal of Risk Research* 2016;19(4):405-24.
- [143] Giambi C, D'Ancona F, Del Manso M, De Mei B, Giovannelli I, Cattaneo C, Possenti V, Declich S, Local Representatives for V. Exploring reasons for non-vaccination against human papillomavirus in Italy. *BMC Infect Dis* 2014;14:545. <https://doi.org/10.1186/s12879-014-0545-9>
- [144] Gilbert NL, Gilmour H, Dube E, Wilson SE, Laroche J. Estimates and determinants of HPV non-vaccination and vaccine refusal in girls 12 to 14 y of age in Canada: Results from the Childhood National Immunization Coverage Survey, 2013. *Hum Vaccin Immunother* 2016;12(6):1484-90. <https://doi.org/10.1080/21645515.2016.1153207>
- [145] Gilkey MB, Calo WA, Marciniak MW, Brewer NT. Parents who refuse or delay HPV vaccine: Differences in vaccination behavior, beliefs, and clinical communication preferences. *Hum Vaccin Immunother* 2017;13(3):680-6. <https://doi.org/10.1080/21645515.2016.1247134>
- [146] Glanz JM, Wagner NM, Narwaney KJ, Shoup JA, McClure DL, McCormick EV, Daley MF. A mixed methods study of parental vaccine decision making and parent-provider trust. *Acad Pediatr* 2013;13(5) 481-8. <https://doi.org/10.1016/j.acap.2013.05.030>
- [147] Glenn BA, Tsui J, Coronado GD, Fernandez ME, Savas LS,

- Taylor VM, Bastani R. Understanding HPV vaccination among Latino adolescent girls in three U.S. regions. *J Immigr Minor Health* 2015;17(1):96-103. <https://doi.org/10.1007/s10903-014-9996-8>
- [148] Gomez Y, Leguen F, Zhang G, O'Connell E. Correlates of 2009 H1N1 influenza vaccination among day care-aged children, Miami-Dade County. *Vaccine* 2012;30(27): 4002-6. <https://doi.org/10.1016/j.vaccine.2012.04.037>
- [149] Gottlieb SL, Brewer NT, Sternberg MR, Smith JS, Ziarnowski K, Liddon N, Markowitz LE. Human papillomavirus vaccine initiation in an area with elevated rates of cervical cancer. *J Adolesc Health* 2009;45(5):430-7. <https://doi.org/10.1016/j.jadohealth.2009.03.029>
- [150] Gowda C, Schaffer SE, Kopec K, Markel A, Dempsey AF. Does the relative importance of MMR vaccine concerns differ by degree of parental vaccine hesitancy?: An exploratory study. *Hum Vaccin Immunother* 2013;9(2):430-6. <https://doi.org/10.4161/hv.22065>
- [151] Grabel M, Reutzell TJ, Wang S, Rubin R, Leung V, Ordonez A, Wong M, Jordan E. HPV and HPV vaccines: the knowledge levels, opinions, and behavior of parents. *J Community Health* 2013;38(6):1015-21. <https://doi.org/10.1007/s10900-013-9725-6>
- [152] Grandahl M, Oscarsson M, Stenhammar C, Neveus T, Westerling R, Tyden T. Not the right time: why parents refuse to let their daughters have the human papillomavirus vaccination. *Acta Paediatr* 2014;103(4):436-41. <https://doi.org/10.1111/apa.12545>
- [153] Grandahl M, Tyden T, Westerling R, Neveus T, Rosenblad A, Hedin E, Oscarsson M. To Consent or Decline HPV Vaccination: A Pilot Study at the Start of the National School-Based Vaccination Program in Sweden. *J Sch Health* 2017;87(1):62-70. <https://doi.org/10.1111/josh.12470>
- [154] Greenberg J, Dube E, Driedger M. Vaccine Hesitancy: In Search of the Risk Communication Comfort Zone. *PLoS Curr*;2017;9. <https://doi.org/10.1371/currents.outbreaks.0561a011117a1d1f9596e24949e8690b>
- [155] Greenfield LS, Page LC, Kay M, Li-Vollmer M, Breuner CC, Duchin JS. Strategies for increasing adolescent immunizations in diverse ethnic communities. *J Adolesc Health* 2015;56(5 Suppl):S47-53. <https://doi.org/10.1016/j.jadohealth.2014.10.274>
- [156] Griebeler M, Feferman H, Gupta V, Patel D. Parental beliefs and knowledge about male human papillomavirus vaccination in the US: a survey of a pediatric clinic population. *Int J Adolesc Med Health* 2012;24(4):315-20. <https://doi.org/10.1515/ijamh.2012.045>
- [157] Guerry SL, De Rosa CJ, Markowitz LE, Walker S, Liddon N, Kerndt PR, Gottlieb SL. Human papillomavirus vaccine initiation among adolescent girls in high-risk communities. *Vaccine* 2011;29(12):2235-41. <https://doi.org/10.1016/j.vaccine.2011.01.052>
- [158] Gundogdu Z, Gundogdu O. Parental attitudes and varicella vaccine in Kocaeli, Turkey. *Prev Med* 2011;52(3-4):278-80. <https://doi.org/10.1016/j.jpmed.2011.01.011>
- [159] Gunduz S, Yuksel NC, Aktoprak HB, Canbal M, Kaya M. Attitudes towards influenza vaccination in high socioeconomic status Turkish parents. *Turk J Med Sci* 2014;44(4):649-55. <https://doi.org/10.3906/sag-1305-43>
- [160] Gupta R, Alkhateeb FM, Latif DA, Farley KN. Parental attitudes affecting compliance with the recommendation for two doses of 2009 pandemic influenza A (H1N1) vaccine in children less than 10 years of age in West Virginia. *W V Med J* 2013; 109(2):10-4.
- [161] Gust D, Brown C, Sheedy K, Hibbs B, Weaver D, Nowak G. Immunization attitudes and beliefs among parents: beyond a dichotomous perspective. *Am J Health Behav* 2005;29(1):81-92. <https://doi.org/10.5993/ajhb.29.1.7>
- [162] Gust DA, Campbell S, Kennedy A, Shui I, Barker L, Schwartz B. Parental concerns and medical-seeking behavior after immunization. *Am J Prev Med* 2006;31(1):32-5. <https://doi.org/10.1016/j.amepre.2006.03.017>
- [163] Gust DA, Darling N, Kennedy A, Schwartz B. Parents with doubts about vaccines: which vaccines and reasons why. *Pediatrics* 2008;122(4):718-25. <https://doi.org/10.1542/peds.2007-0538>
- [164] Gust DA, Kennedy A, Shui I, Smith PJ, Nowak G, Pickering LK. Parent attitudes toward immunizations and healthcare providers the role of information. *Am J Prev Med* 2005;29(2):105-12. <https://doi.org/10.1016/j.amepre.2005.04.010>
- [165] Gust DA, Strine TW, Maurice E, Smith P, Yusuf H, Wilkinson M, Battaglia M, Wright R, Schwartz B. Underimmunization among children: effects of vaccine safety concerns on immunization status. *Pediatrics* 2004;114(1):e16-22. <https://doi.org/10.1542/peds.114.1.e16>
- [166] Gust, D.A., Woodruff, R., Kennedy, A., Brown, C., Sheedy, K., and Hibbs, B., Parental perceptions surrounding risks and benefits of immunization. *Semin Pediatr Infect Dis*;2003;14(3): 207-12. [https://doi.org/10.1016/s1045-1870\(03\)00035-9](https://doi.org/10.1016/s1045-1870(03)00035-9)
- [167] Gustafson R, Skowronski DM. Disparities in varicella vaccine coverage in the absence of public funding. *Vaccine* 2005; 23(27):3519-25. <https://doi.org/10.1016/j.vaccine.2005.02.001>
- [168] Haesebaert J, Lutringer-Magnin D, Kalecinski J, Barone G, Jacquard AC, Regnier V, Leocmach Y, Vanhems P, Chauvin F, Lasset C. French women's knowledge of and attitudes towards cervical cancer prevention and the acceptability of HPV vaccination among those with 14 - 18 year old daughters: a quantitative-qualitative study. *BMC Public Health* 2012;12:1034. <https://doi.org/10.1186/1471-2458-12-1034>
- [169] Hagan D, Phethlu DR. Determinants of parents' decisions on childhood immunisations at Kumasi Metropolis in Ghana. *Curationis* 2016;39(1): e1-e <https://doi.org/10.1016/j.curationis.v39i1.1554>
- [170] Hagemann C, Streng A, Kraemer A, Liese JG. Heterogeneity in coverage for measles and varicella vaccination in toddlers - analysis of factors influencing parental acceptance. *BMC Public Health* 2017;17(1):724. <https://doi.org/10.1186/s12889-017-4725-6>
- [171] Hak E, Schonbeck Y, De Melker H, Van Essen GA, Sanders EA. Negative attitude of highly educated parents and health care workers towards future vaccinations in the Dutch childhood vaccination program. *Vaccine* 2005;23(24):3103-7. <https://doi.org/10.1016/j.vaccine.2005.01.074>
- [172] Hamama-Raz Y, Ginossar-David E, Ben-Ezra M. Parental regret regarding children's vaccines-The correlation between anticipated regret, altruism, coping strategies and attitudes toward vaccines. *Isr J Health Policy Res* 2016;5:55. <https://doi.org/10.1186/s13584-016-0116-1>
- [173] Han K, Zheng H, Huang Z, Qiu Q, Zeng H, Chen B, Xu J. Vaccination coverage and its determinants among migrant children in Guangdong, China. *BMC Public Health* 2014;14:203. <https://doi.org/10.1186/1471-2458-14-203>
- [174] Hanley SJ, Yoshioka E, Ito Y, Konno R, Hayashi Y, Kishi R, Sakuragi N. Acceptance of and attitudes towards human papillomavirus vaccination in Japanese mothers of adolescent girls. *Vaccine* 2012;30(39):5740-7. <https://doi.org/10.1016/j.vaccine.2012.07.003>
- [175] Hanley SJ, Yoshioka E, Ito Y, Konno R, Sasaki Y, Kishi R, Sakuragi N. An exploratory study of Japanese fathers' knowledge of and attitudes towards HPV and HPV vaccination: does marital status matter? *Asian Pac J Cancer Prev* 2014;15(4): 1837-43. <https://doi.org/10.7314/apjcp.2014.15.4.1837>
- [176] Harmsen IA, Lambooi MS, Ruiter RA, Mollema L, Veldwijk J, van Weert YJ, Kok G, Paulussen TG, de Wit GA, de Melker HE. Psychosocial determinants of parents' intention to vaccinate their newborn child against hepatitis B. *Vaccine* 2012;30(32): 4771-7. <https://doi.org/10.1016/j.vaccine.2012.05.034>
- [177] He L, Liao QY, Huang YQ, Feng S, Zhuang XM. Parents' per-

- ception and their decision on their children's vaccination against seasonal influenza in Guangzhou. *Chin Med J (Engl)* 2015; 128(3):327-41. <https://doi.org/10.4103/0366-6999.150099>
- [178] Healy CM, Montesinos DP, Middleman AB. Parent and provider perspectives on immunization: are providers overestimating parental concerns? *Vaccine* 2014;32(5): 579-84. <https://doi.org/10.1016/j.vaccine.2013.11.076>
- [179] Henrikson NB, Anderson ML, Opel DJ, Dunn J, Marcuse EK, Grossman DC. Longitudinal Trends in Vaccine Hesitancy in a Cohort of Mothers Surveyed in Washington State, 2013-2015. *Public Health Rep* 2017;132(4):451-4. <https://doi.org/10.1177/0033354917711175>
- [180] Hertweck SP, LaJoie AS, Pinto MD, Flamini L, Lynch T, Logsdon MC. Health care decision making by mothers for their adolescent daughters regarding the quadrivalent HPV vaccine. *J Pediatr Adolesc Gynecol* 2013;26(2):96-101. <https://doi.org/10.1016/j.jpap.2012.10.009>
- [181] Hilyard KM, Quinn SC, Kim KH, Musa D, Freimuth VS. Determinants of Parental Acceptance of the H1N1 Vaccine. *Health Educ Behav* 2014;41(3):307-14. <https://doi.org/10.1177/1090198113515244>
- [182] Hofman R, van Empelen P, Richardus JH, de Kok IM, de Koning HJ, van Ballegooijen M, Korfage JJ. Predictors of HPV vaccination uptake: a longitudinal study among parents. *Health Educ Res* 2014;29(1):83-96. <https://doi.org/10.1093/her/cyt092>
- [183] Hofstetter AM, Barrett A, Stockwell MS. Factors impacting influenza vaccination of urban low-income Latino children under nine years requiring two doses in the 2010-2011 season. *J Community Health* 2015;40(2):227-34. <https://doi.org/10.1007/s10900-014-9921-z>
- [184] Hon KL, Tsang YC, Chan LC, Ng DK, Miu TY, Chan JY, Lee A, Leung TF, Hong Kong Society of Paediatric Research and Allergy. A community-based cross-sectional immunisation survey in parents of primary school students. *NPJ Prim Care Respir Med* 2016;26:16011. <https://doi.org/10.1038/nppcrim.2016.11>
- [185] Hontelez JA, Hahne SJ, Oomen P, de Melker H. Parental attitude towards childhood HBV vaccination in The Netherlands. *Vaccine* 2013;31(42):4860-6. <https://doi.org/10.1016/j.vaccine.2013.07.068>
- [186] Horn L, Howard C, Waller J, Ferris DG. Opinions of parents about school-entry mandates for the human papillomavirus vaccine. *J Low Genit Tract Dis* 2013;14(1): 43-8. <https://doi.org/10.1097/LGT.0b013e3181b0fad4>
- [187] How CH, Phua See Chun P, Shafi F, Jakes RW. Parental knowledge, attitudes and perception of pneumococcal disease and pneumococcal conjugate vaccines in Singapore: a questionnaire-based assessment. *BMC Public Health* 2016;16:923. <https://doi.org/10.1186/s12889-016-3597-5>
- [188] Hu Y, Li Q, Chen Y. Timeliness of Childhood Primary Immunization and Risk Factors Related with Delays: Evidence from the 2014 Zhejiang Provincial Vaccination Coverage Survey. *Int J Environ Res Public Health* 2017;14(9). <https://doi.org/10.3390/ijerph14091086>
- [189] Hwang JH, Lim CH, Kim DH, Eun BW, Jo DS, Song YH, Kim YK. A Survey of Parental Perception and Pattern of Action in Response to Influenza-like Illness in Their Children: Including Healthcare Use and Vaccination in Korea. *J Korean Med Sci* 2017;32(2):204-11. <https://doi.org/10.3346/jkms.2017.32.2.204>
- [190] Ilter E, Celik A, Haliloglu B, Unlugedik E, Midi A, Gunduz T, Ozekici U. Women's knowledge of Pap smear test and human papillomavirus: acceptance of HPV vaccination to themselves and their daughters in an Islamic society. *Int J Gynecol Cancer* 2013;23(6): 1058-62. <https://doi.org/10.1111/IGC.0b013e3181dda2b9>
- [191] Imburgia TM, Hendrix KS, Donahue KL, Sturm LA, Zimet GD. Predictors of influenza vaccination in the U.S. among children 9-13 years of age. *Vaccine* 2017;35(18):2338-42. <https://doi.org/10.1016/j.vaccine.2017.03.060>
- [192] Impicciatore P, Bosetti C, Schiavio S, Pandolfini C, Bonati M. Mothers as active partners in the prevention of childhood diseases: maternal factors related to immunization status of preschool children in Italy. *Prev Med* 2000;31(1):49-55. <https://doi.org/10.1006/pmed.2000.0677>
- [193] Jani JV, De Schacht C, Jani IV, Bjune G. Risk factors for incomplete vaccination and missed opportunity for immunization in rural Mozambique. *BMC Public Health* 2008;8:161. <https://doi.org/10.1186/1471-2458-8-161>
- [194] Jaspers L, Budiningsih S, Wolterbeek R, Henderson FC, Peters AA. Parental acceptance of human papillomavirus (HPV) vaccination in Indonesia: a cross-sectional study. *Vaccine* 2011;29(44):7785-93. <https://doi.org/10.1016/j.vaccine.2011.07.107>
- [195] Jessop LJ, Murrin C, Lotya J, Clarke AT, O'Mahony D, Fallon UB, Johnson H, Bury G, Kelleher, CC, Murphy AW, Lifeways Cohort Study Steering G. Socio-demographic and health-related predictors of uptake of first MMR immunisation in the Lifeways Cohort Study. *Vaccine* 2010;28(38): 6338-43. <https://doi.org/10.1016/j.vaccine.2010.06.092>
- [196] Jolley D, Douglas KM. The effects of anti-vaccine conspiracy theories on vaccination intentions. *PLoS One* 2014;9(2): e89177. <https://doi.org/10.1371/journal.pone.0089177>
- [197] Joseph NP, Clark JA, Bauchner H, Walsh JP, Mercilus G, Figaro J, Bibbo C, Perkins RB. Knowledge, attitudes, and beliefs regarding HPV vaccination: ethnic and cultural differences between African-American and Haitian immigrant women. *Women's Health Issues* 2012;22(6): e571-9. <https://doi.org/10.1016/j.whi.2012.09.003>
- [198] Joseph NP, Shea K, Porter CL, Walsh JP, Belizaire M, Estervine G, Perkins R. Factors Associated with Human Papillomavirus Vaccine Acceptance Among Haitian and African-American parents of Adolescent Sons. *J Natl Med Assoc* 2015;107(2):80-8. [https://doi.org/10.1016/S0027-9684\(15\)30028-6](https://doi.org/10.1016/S0027-9684(15)30028-6)
- [199] Jung M, Lin L, Viswanath K. Associations between health communication behaviors, neighborhood social capital, vaccine knowledge, and parents' H1N1 vaccination of their children. *Vaccine* 2013;31(42):4860-6. <https://doi.org/10.1016/j.vaccine.2013.07.068>
- [200] Kadis JA, McRee AL, Gottlieb SL, Lee MR, Reiter PL, Dittus PJ, Brewer NT. Mothers' support for voluntary provision of HPV vaccine in schools. *Vaccine* 2011;29(14):2542-7. <https://doi.org/10.1016/j.vaccine.2011.01.067>
- [201] Kahn JA, Ding L, Huang B, Zimet GD, Rosenthal SL, Frazier AL. Mothers' intention for their daughters and themselves to receive the human papillomavirus vaccine: a national study of nurses. *Pediatrics* 2009;123(6):1439-45. <https://doi.org/10.1542/peds.2008-1536>
- [202] Kalucka S, Lopata E. Age-conditioned differences in parents' attitudes towards compulsory vaccination. *Family Medicine and Primary Care Review* 2016;18(4):425-8.
- [203] Katz ML, Kam JA, Krieger JL, Roberto AJ. Predicting human papillomavirus vaccine intentions of college-aged males: an examination of parents' and son's perceptions. *J Am Coll Health* 2012;60(6):449-59. <https://doi.org/10.1080/07448481.2012.673523>
- [204] Haesebaert J, Lutringer-Magnin D, Kalecinski J, Barone G, Jacquard AC, Leocmach Y, Regnier V, Vanhems P, Chauvin F, Lasset C. Disparities of perceptions and practices related to cervical cancer prevention and the acceptability of HPV vaccination according to educational level in a French cross-sectional survey of 18-65 years old women. *PLoS One* 2014;9(10):e109320. <https://doi.org/10.1371/journal.pone.0109320>
- [205] Kaya A, Altinel N, Karakaya G, Cetinkaya F. Knowledge and attitudes among patients with asthma and parents and physicians towards influenza vaccination. *Allergol Immunopathol (Madr)* 2017;45(3):240-3. <https://doi.org/10.1016/j.aller.2016.08.003>
- [206] Kelley CA, Velazco CS, Delaney TV, Bensimhon A, Huang KN, Jarvis PR, Jolin JS, Schaberg KB, Burke M, Finley C, Carney JK. Factors contributing to suboptimal rates of childhood vac-

- cinations in Vermont. *J Child Health Care* 2015;19(4):558-68. <https://doi.org/10.1177/1367493514530955>
- [207] Kempe A, Daley MF, Crane LA, Barrow J, Chandramouli V, Beaty BL, Allred NJ, Berman S. Misperceptions regarding influenza vaccine safety for individuals with chronic medical illness. *Prev Med* 2007;45(1):80-2. <https://doi.org/10.1016/j.ypmed.2006.12.001>
- [208] Kennedy A, Basket M, Sheedy K. Vaccine attitudes, concerns, and information sources reported by parents of young children: results from the 2009 HealthStyles survey. *Pediatrics* 2011;127 Suppl 1: S92-9. <https://doi.org/10.1542/peds.2010-1722N>
- [209] Kennedy A, Lavail K, Nowak G, Basket M, Landry S. Confidence about vaccines in the United States: understanding parents' perceptions. *Health Aff (Millwood)* 2011;30(6):1151-9. <https://doi.org/10.1377/hlthaff.2011.0396>
- [210] Kennedy AM, Brown CJ, Gust DA. Vaccine beliefs of parents who oppose compulsory vaccination. *Public Health Rep* 2005; 120(3):252-8. <https://doi.org/10.1177/003335490512000306>
- [211] Kepka D, Ding Q, Bodson J, Warner EL, Mooney K. Latino Parents' Awareness and Receipt of the HPV Vaccine for Sons and Daughters in a State with Low Three-Dose Completion. *J Cancer Educ* 2015;30(4):808-12. <https://doi.org/10.1007/s13187-014-0781-0>
- [212] Kepka D, Warner EL, Kinney AY, Spigarelli MG, Mooney K. Low human papillomavirus (HPV) vaccine knowledge among Latino parents in Utah. *J Immigr Minor Health* 2015;17(1): 125-31. <https://doi.org/10.1007/s10903-014-0003-1>
- [213] Kepka DL, Ulrich AK, Coronado GD. Low knowledge of the three-dose HPV vaccine series among mothers of rural Hispanic adolescents. *J Health Care Poor Underserved* 2012;23(2):626-35. <https://doi.org/10.1353/hpu.2012.0040>
- [214] Kester LM, Zimet GD, Fortenberry JD, Kahn JA, Shew ML. A national study of HPV vaccination of adolescent girls: rates, predictors, and reasons for non-vaccination. *Matern Child Health J* 2013;17(5):879-85. <https://doi.org/10.1007/s10995-012-1066-z>
- [215] Kettunen C, Nemecek J, Wenger O. Evaluation of low immunization coverage among the Amish population in rural Ohio. *Am J Infect Control* 2017;45(6):630-4. <https://doi.org/10.1016/j.ajic.2017.01.032>
- [216] Kim KM, Choi JS. Mothers' intentions to vaccinate their teen-aged children against human papillomavirus, as predicted by sex in South Korea: An application of the theory of planned behavior. *Jpn J Nurs Sci* 2017;14(4):288-96. <https://doi.org/10.1111/jjns.12155>
- [217] Kinder F. Parental Refusal of the Human Papillomavirus Vaccine. *Journal of Pediatric Health Care* 2016;30(6):551-7.
- [218] Ko HS, Jo YS, Kim YH, Park YG, Wie JH, Cheon J, Moon HB, Lee Y, Shin JC. Knowledge and Acceptability about Adult Pertussis Immunization in Korean Women of Childbearing Age. *Yonsei Med J* 2015;56(4):1071-8. <https://doi.org/10.3349/ymj.2015.56.4.1071>
- [219] Kong KA, Yoon SH, Cho SJ, Kim HW, Kim KH. Public acceptance and willingness to hepatitis a vaccination in children aged 7-18 years in Republic of Korea. *J Korean Med Sci* 2014; 29(11):1528-35. <https://doi.org/10.3346/jkms.2014.29.11.1528>
- [220] Krawczyk A, Knauper B, Gilca V, Dube E, Perez S, Joyal-Desmarais K, Rosberger Z. Parents' decision-making about the human papillomavirus vaccine for their daughters: I. Quantitative results. *Hum Vaccin Immunother* 2015;11(2):322-9. <https://doi.org/10.1080/21645515.2014.1004030>
- [221] Krawczyk A, Perez S, King L, Vivion M, Dube E, Rosberger Z. Parents' decision-making about the human papillomavirus vaccine for their daughters: II. Qualitative results. *Hum Vaccin Immunother* 2015;11(2):330-6. <https://doi.org/10.4161/21645515.2014.980708>
- [222] Krieger J, Kam J, Katz M, Roberto A. Does mother know best? An actor-partner model of college-age women's human papillomavirus vaccination behavior. *Human Communication Research*, 2011;31(1):107-24.
- [223] Lavail KH, Kennedy AM. The role of attitudes about vaccine safety, efficacy, and value in explaining parents' reported vaccination behavior. *Health Educ Behav* 2013;40(5):544-51. <https://doi.org/10.1177/1090198112463022>
- [224] Le Ngoc Tho S, Ader F, Ferry T, Floret D, Arnal M, Fargeas S, Chidiac C, Valour F. Vaccination against serogroup B *Neisseria meningitidis*: Perceptions and attitudes of parents. *Vaccine* 2015; 33(30):3463-70. <https://doi.org/10.1016/j.vaccine.2015.05.073>
- [225] Lechuga J, Swain G, Weinhardt LS. Perceived need of a parental decision aid for the HPV vaccine: content and format preferences. *Health Promot Pract* 2012;13(2):214-21. <https://doi.org/10.1177/1524839910388622>
- [226] Lee KN, Chang KH, Cho SS, Park SH, Park ST. Attitudes Regarding HPV Vaccinations of Children among Mothers with Adolescent Daughters in Korea. *J Korean Med Sci* 2017;32(1): 130-4. <https://doi.org/10.3346/jkms.2017.32.1.130>
- [227] Lee Mortensen G, Adam M, Idtaleb L. Parental attitudes towards male human papillomavirus vaccination: a pan-European cross-sectional survey. *BMC Public Health* 2015;15:624. <https://doi.org/10.1186/s12889-015-1863-6>
- [228] Lehmann BA, de Melker HE, Timmermans DRM, Mollema L. Informed decision making in the context of childhood immunization. *Patient Educ Couns* 2017;100(12):2339-45. <https://doi.org/10.1016/j.pec.2017.06.015>
- [229] Lewis T, Osborn LM, Lewis K, Brockert J, Jacobsen J, Cherry JD. Influence of parental knowledge and opinions on 12-month diphtheria, tetanus, and pertussis vaccination rates. *Am J Dis Child* 1988;142(3):283-6. <https://doi.org/10.1001/archpedi.1988.02150030053018>
- [230] Liao Q, Lam WW, Cowling BJ, Fielding R. Psychosocial Influences on Parental Decision-Making Regarding Vaccination Against Seasonal Influenza for Young Children in Hong Kong: a Longitudinal Study, 2012-2013. *Int J Behav Med* 2016;23(5): 621-34. <https://doi.org/10.1007/s12529-016-9551-1>
- [231] Lin CJ, Nowalk MP, Zimmerman RK, Ko FS, Zoffel L, Hoberman A, Kearney DH. Beliefs and attitudes about influenza immunization among parents of children with chronic medical conditions over a two-year period. *J Urban Health* 2006;83(5): 874-83. <https://doi.org/10.1007/s11524-006-9084-z>
- [232] Linam WM, Gilliam CH, Honeycutt M, Wisdom C, Swearingen CJ, Romero JR. Parental perceptions about required influenza immunization of pediatric healthcare personnel. *Infect Control Hosp Epidemiol* 2014;35(10):1301-3. <https://doi.org/10.1086/678061>
- [233] Lindley MC, Jeyarajah J, Yankey D, Curtis CR, Markowitz LE, Stokley S. Comparing human papillomavirus vaccine knowledge and intentions among parents of boys and girls. *Hum Vaccin Immunother* 2016;12(6):1519-27. <https://doi.org/10.1080/21645515.2016.1157673>
- [234] Livni G, Wainstein A, Birk E, Chodick G, Levy I. Influenza Vaccination Rate and Reasons for Nonvaccination in Children With Cardiac Disease. *Pediatr Infect Dis J* 2017;36(11):e268-e271. <https://doi.org/10.1097/INF.0000000000001579>
- [235] Loke AY, Chan ACO, Wong YT. Facilitators and barriers to the acceptance of human papillomavirus (HPV) vaccination among adolescent girls: a comparison between mothers and their adolescent daughters in Hong Kong. *BMC Res Notes* 2017;10(1): 390. <https://doi.org/10.1186/s13104-017-2734-2>
- [236] Low MSF, Tan H, Hartman M, Tam CC, Hoo C, Lim J, Chiow S, Lee S, Thng R, Cai M, Tan Y, Lock J. Parental perceptions of childhood seasonal influenza vaccination in Singapore: A cross-sectional survey. *Vaccine* 2017;35(45):6096-102. <https://doi.org/10.1016/j.vaccine.2017.09.060>
- [237] Luthy KE, Beckstrand RL, Callister LC. Parental hesitation in immunizing children in Utah. *Public Health Nurs*, 20 [https://doi.org/10.27\(1\):25-31](https://doi.org/10.27(1):25-31). <https://doi.org/10.1111/j.1525-1446.2009.00823.x>

- [238] Luthy KE, Beckstrand RL, Meyers CJ. Common perceptions of parents requesting personal exemption from vaccination. *J Sch Nurs* 2013;29(2):95-103. <https://doi.org/10.1177/1059840512455365>
- [239] Luthy KE, Beckstrand RL, Peterson NE. Parental hesitation as a factor in delayed childhood immunization. *J Pediatr Health Care* 2009;23(6):388-93. <https://doi.org/10.1016/j.pedhc.2008.09.006>
- [240] Maayan-Metzger A, Kedem-Friedrich P, Kuint J. To vaccinate or not to vaccinate--that is the question: why are some mothers opposed to giving their infants hepatitis B vaccine? *Vaccine* 2005;23(16):1941-8. <https://doi.org/10.1016/j.vaccine.2004.10.015>
- [241] MacDonald SE, Schopflocher DP, Vaudry W. Parental concern about vaccine safety in Canadian children partially immunized at age 2: a multivariable model including system level factors. *Hum Vaccin Immunother* 2014;10(9):2603-11. <https://doi.org/10.4161/21645515.2014.970075>
- [242] MacDougall DM, Halperin BA, Langley JM, MacKinnon-Cameron D, Li L, Halperin SA, Maritime Universal Rotavirus Vaccination Program. Knowledge, attitudes, beliefs, and behaviors of parents and healthcare providers before and after implementation of a universal rotavirus vaccination program. *Vaccine* 2016;34(5):687-95. <https://doi.org/10.1016/j.vaccine.2015.09.089>
- [243] Madhivanan P, Li T, Srinivas V, Marlow L, Mukherjee S, Krupp K. Human papillomavirus vaccine acceptability among parents of adolescent girls: obstacles and challenges in Mysore, India. *Prev Med* 2014;64:69-74. <https://doi.org/10.1016/j.ypmed.2014.04.002>
- [244] Mameli C, Faccini M, Mazzali C, Picca M, Colella G, Duca PG, Zuccotti GV. Acceptability of meningococcal serogroup B vaccine among parents and health care workers in Italy: a survey. *Hum Vaccin Immunother* 2014;10(10):3004-10. <https://doi.org/10.4161/21645515.2014.971602>
- [245] Marlow LA, Waller J, Wardle J. Trust and experience as predictors of HPV vaccine acceptance. *Hum Vaccin* 2007;3(5):171-5. <https://doi.org/10.4161/hv.3.5.4310>
- [246] Marlow LA, Waller J, Wardle J. Parental attitudes to pre-pubertal HPV vaccination. *Vaccine* 2007;25(11):1945-52. <https://doi.org/10.1016/j.vaccine.2007.01.059>
- [247] Marshall H, Clarke M, Sullivan T. Parental and community acceptance of the benefits and risks associated with meningococcal B vaccines. *Vaccine* 2014;32(3):338-44. <https://doi.org/10.1016/j.vaccine.2013.11.042>
- [248] Marshall H, Ryan P, Robertson D, Baghurst P. A cross-sectional survey to assess community attitudes to introduction of human papillomavirus vaccine. *Aust N Z J Public Health* 2007;31(3):235-42. <https://doi.org/10.1111/j.1467-842x.2007.00054.x>
- [249] Mayet AY, Al-Shaikh GK, Al-Mandeel HM, Alsaleh NA, Hamad AF. Knowledge, attitudes, beliefs, and barriers associated with the uptake of influenza vaccine among pregnant women. *Saudi Pharm J* 2017;25(1):76-82. <https://doi.org/10.1016/j.sjps.2015.12.001>
- [250] McCauley MM, Kennedy A, Basket M, Sheedy K. Exploring the choice to refuse or delay vaccines: a national survey of parents of 6- through 23-month-olds. *Acad Pediatr* 2012;12(5):375-83. <https://doi.org/10.1016/j.acap.2012.06.007>
- [251] McHale P, Keenan A, Ghebrehewet S. Reasons for measles cases not being vaccinated with MMR: investigation into parents' and carers' views following a large measles outbreak. *Epidemiol Infect* 2016;144(4):870-5. <https://doi.org/10.1017/S0950268815001909>
- [252] Melman ST, Nguyen TT, Ehrlich E, Schorr M, Anbar RD. Parental compliance with multiple immunization injections. *Arch Pediatr Adolesc Med* 1999;153(12):1289-91. <https://doi.org/10.1001/archpedi.153.12.1289>
- [253] Meszaros JR, Asch DA, Baron J, Hershey JC, Kunreuther H, Schwartz-Buzaglo J. Cognitive processes and the decisions of some parents to forego pertussis vaccination for their children. *J Clin Epidemiol* 1996;49(6):697-703. [https://doi.org/10.1016/0895-4356\(96\)00007-8](https://doi.org/10.1016/0895-4356(96)00007-8)
- [254] Michael CA, Ogbuanu IU, Storms AD, Oluabunwo CJ, Corcum M, Ashenafi S, Achari P, Biya O, Nguku P, Mahoney F, Team NORs. An assessment of the reasons for oral poliovirus vaccine refusals in northern Nigeria. *J Infect Dis* 2014;210 Suppl 1:S125-30. <https://doi.org/10.1093/infdis/jiu436>
- [255] Michael EC, Olagbuji BN. Human papilloma virus vaccine: determinants of acceptability by mothers for adolescents in Nigeria. *Afr J Reprod Health* 2014;18(3):154-8.
- [256] Middleman AB, Guajardo AD, Sunwoo E, Sansaricq KM. Parent knowledge and attitudes about school-based hepatitis B immunization programs. *J Sch Health* 2002;72(8):348-51. <https://doi.org/10.1111/j.1746-1561.2002.tb07923.x>
- [257] Milteer RM, Jonna S. Parental reasons for delayed immunizations in children hospitalized in a Washington, DC, public hospital. *J Natl Med Assoc* 1996;88(7):433-6.
- [258] Morales-Campos DY, Parra-Medina D. Predictors of Human Papillomavirus Vaccine Initiation and Completion Among Latino Mothers of 11- to 17-Year-Old Daughters Living Along the Texas-Mexico Border. *Fam Community Health* 2017;40(2):139-49. <https://doi.org/10.1097/FCH.0000000000000144>
- [259] Morhason-Bello IO, Wallis S, Adedokun BO, Adewole IF. Willingness of reproductive-aged women in a Nigerian community to accept human papillomavirus vaccination for their children. *J Obstet Gynaecol Res* 2015;41(10):1621-9. <https://doi.org/10.1111/jog.12775>
- [260] Morrone T, Napolitano F, Albano L, Di Giuseppe G. Meningococcal serogroup B vaccine: Knowledge and acceptability among parents in Italy. *Hum Vaccin Immunother* 2017;13(8):1921-7. <https://doi.org/10.1080/21645515.2017.1313940>
- [261] Mouldsdale P, Grant A, Fletcher M, Finn A. Parents' perceptions of influenza and why they accept or decline the nasal vaccine for their child. *Nurs Child Young People* 2017;29(3):28-33. <https://doi.org/10.7748/ncyp.2017.e854>
- [262] Muhwezi WW, Banura C, Turiho AK, Mirembe F. Parents' knowledge, risk perception and willingness to allow young males to receive human papillomavirus (HPV) vaccines in Uganda. *PLoS One* 2014;9(9):e106686. <https://doi.org/10.1371/journal.pone.0106686>
- [263] Murakami H, Kobayashi M, Hachiya M, Khan ZS, Hassan SQ, Sakurada S. Refusal of oral polio vaccine in northwestern Pakistan: a qualitative and quantitative study. *Vaccine* 2014;32(12):1382-7. <https://doi.org/10.1016/j.vaccine.2014.01.018>
- [264] My C, Danchin M, Willaby HW, Pemberton S, Leask J. Parental attitudes, beliefs, behaviours and concerns towards childhood vaccinations in Australia: A national online survey. *Aust Fam Physician* 2017;46(3):145-51.
- [265] Naeem M, Adil M, Abbas SH, Khan MZ, Naz SM, Khan A, Khan, MU. Coverage and causes of missed oral polio vaccine in urban and rural areas of Peshawar. *J Ayub Med Coll Abbottabad* 2011;23(4):98-102.
- [266] Naeem M, Khan MZ, Abbas SH, Adil M, Khan MU, Naz SM. Factors associated with low hepatitis B vaccination; a user and provider perspective study in Peshawar. *J Pak Med Assoc* 2011;61(11):1125-7.
- [267] Namuigi P, Phuanukoonnon S. Barriers to measles immunization: the beliefs and attitudes of caregivers in Goroka, Eastern Highlands Province, Papua New Guinea. *P N G Med J* 2005;48(3-4):183-7.
- [268] Niederhauser VP, Markowitz M. Barriers to immunizations: Multiethnic parents of under- and unimmunized children speak. *J Am Acad Nurse Pract* 2007;19(1):15-23. <https://doi.org/10.1111/j.1745-7599.2006.00185.x>
- [269] Oladokun RE, Adedokun BO, Lawoyin TO. Children not receiving adequate immunization in Ibadan, Nigeria: what reasons and beliefs do their mothers have? *Niger J Clin Pract* 2013;13(2):173-8. [https://doi.org/10.13\(2\):173-8](https://doi.org/10.13(2):173-8)

- [270] Onnela JP, Landon BE, Kahn AL, Ahmed D, Verma H, O'Malley AJ, Bahl S, Sutter RW, Christakis NA. Polio vaccine hesitancy in the networks and neighborhoods of Malegaon, India. *Soc Sci Med* 2016;153:99-106. <https://doi.org/10.1016/j.socscimed.2016.01.024>
- [271] Oria PA, Arunga G, Lebo E, Wong JM, Emukule G, Muthoka P, Otieno N, Mutonga D, Breiman, RF, Katz MA. Assessing parents' knowledge and attitudes towards seasonal influenza vaccination of children before and after a seasonal influenza vaccination effectiveness study in low-income urban and rural Kenya, 2010-2011. *BMC Public Health* 2013;13:391. <https://doi.org/10.1186/1471-2458-13-391>
- [272] Ozawa S, Wonodi C, Babalola O, Ismail T, Bridges J. Using best-worst scaling to rank factors affecting vaccination demand in northern Nigeria. *Vaccine* 2017;35(47):6429-37. <https://doi.org/10.1016/j.vaccine.2017.09.079>
- [273] Paek HJ, Shin KA, Park K. Determinants of caregivers' vaccination intention with respect to child age group: a cross-sectional survey in South Korea. *BMJ Open* 2015;5(9):e008342. <https://doi.org/10.1136/bmjopen-2015-008342>
- [274] Painter JE, Gargano LM, Sales JM, Morfaw C, Jones LM, Murray D, Di Clemente RJ, Hughes, JM. Correlates of 2009 H1N1 influenza vaccine acceptability among parents and their adolescent children. *Health Educ Res* 2011;26(5):751-60. <https://doi.org/10.1093/her/cyr025>
- [275] Parrella A, Gold M, Marshall H, Braunack-Mayer A, Baghurst P. Parental perspectives of vaccine safety and experience of adverse events following immunisation. *Vaccine* 2013 31(16):2067-74. <https://doi.org/10.1016/j.vaccine.2013.02.011>
- [276] Parrella A, Gold M, Marshall H, Braunack-Mayer A, Watson M, Baghurst P. Parental views on vaccine safety and future vaccinations of children who experienced an adverse event following routine or seasonal influenza vaccination in 20 https://doi.org/10. Hum Vaccin Immunother 2012;8(5):662-7. <https://doi.org/10.4161/hv.19478>
- [277] Paulussen TG, Hoekstra F, Lanting CI, Buijs GB, Hirasings RA. Determinants of Dutch parents' decisions to vaccinate their child. *Vaccine* 2006;24(5):644-51. <https://doi.org/10.1016/j.vaccine.2005.08.053>
- [278] Peleg N, Zevit N, Shamir R, Chodick G, Levy I. Seasonal influenza vaccination rates and reasons for non-vaccination in children with gastrointestinal disorders. *Vaccine* 2015;33(1):182-6. <https://doi.org/10.1016/j.vaccine.2014.10.086>
- [279] Pelucchi C, Esposito S, Galeone C, Semino M, Sabatini C, Piccioli I, Consolo S, Milani G, Principi N. Knowledge of human papillomavirus infection and its prevention among adolescents and parents in the greater Milan area, Northern Italy. *BMC Public Health* 2010;10:378. <https://doi.org/10.1186/1471-2458-10-378>
- [280] Perez S, Shapiro GK, Tatar O, Joyal-Desmarais K, Rosberger Z. Development and Validation of the Human Papillomavirus Attitudes and Beliefs Scale in a National Canadian Sample. *Sex Transm Dis* 2016;43(10):626-32. <https://doi.org/10.1097/OLQ.0000000000000506>
- [281] Perez S, Tatar O, Gilca V, Shapiro GK, Ogilvie G, Guichon J, Naz A, Rosberger Z. Untangling the psychosocial predictors of HPV vaccination decision-making among parents of boys. *Vaccine* 2017;35(36):4713-21. <https://doi.org/10.1016/j.vaccine.2017.07.043>
- [282] Perez S, Tatar O, Ostini R, Shapiro GK, Waller J, Zimet G, Rosberger Z. Extending and validating a human papillomavirus (HPV) knowledge measure in a national sample of Canadian parents of boys. *Prev Med* 2016;91:43-49. <https://doi.org/10.1016/j.ypmed.2016.07.017>
- [283] Perez S, Tatar O, Shapiro GK, Dube E, Ogilvie G, Guichon J, Gilca V, Rosberger Z. Psychosocial determinants of parental human papillomavirus (HPV) vaccine decision-making for sons: Methodological challenges and initial results of a pan-Canadian longitudinal study. *BMC Public Health* 2016;16(1):1223. <https://doi.org/10.1186/s12889-016-3828-9>
- [284] Podolsky R, Cremer M, Atrio J, Hochman T, Arslan AA. HPV vaccine acceptability by Latino parents: a comparison of U.S. and Salvadoran populations. *J Pediatr Adolesc Gynecol* 2009; 22(4):205-15. <https://doi.org/10.1016/j.jpjag.2008.05.010>
- [285] Pot M, van Keulen HM, Ruitter RAC, Eekhout I, Mollema L, Paulussen T. Motivational and contextual determinants of HPV-vaccination uptake: A longitudinal study among mothers of girls invited for the HPV-vaccination. *Prev Med* 2017;100: 41-49. <https://doi.org/10.1016/j.ypmed.2017.04.005>
- [286] Reiter PL, Katz ML, Paskett ED. Correlates of HPV vaccination among adolescent females from Appalachia and reasons why their parents do not intend to vaccinate. *Vaccine* 2013;31(31): 3121-5. <https://doi.org/10.1016/j.vaccine.2013.04.068>
- [287] Restivo V, Napoli G, Marsala MG, Bonanno V, Sciuto V, Amadio E, Calamusa G, Vitale F, and Firenze A. Factors associated with poor adherence to MMR vaccination in parents who follow vaccination schedule. *Hum Vaccin Immunother* 2015;11(1): 140-5. <https://doi.org/10.4161/hv.34416>
- [288] Roberts JR, Thompson D, Rogacki B, Hale JJ, Jacobson RM, Opel DJ, Darden PM. Vaccine hesitancy among parents of adolescents and its association with vaccine uptake. *Vaccine* 2015; 33(14):1748-55. <https://doi.org/10.1016/j.vaccine.2015.01.068>
- [289] Robitz R, Gottlieb SL, De Rosa CJ, Guerry SL, Liddon N, Zaidi A, Walker S, Smith JS, Brewer, N.T., and Markowitz, L.E., Parent attitudes about school requirements for human papillomavirus vaccine in high-risk communities of Los Angeles, California. *Cancer Epidemiol Biomarkers Prev* 2011;20(7):1421-9. <https://doi.org/10.1158/1055-9965.EPI-10-1236>
- [290] Rogers C. Parents' vaccine beliefs: a study of experiences and attitudes among parents of children in private pre-schools. *R I Med J* (2013), 2014;97(4):27-30.
- [291] Ruffin MTT, Hade EM, Gorsline MR, DeGraffinreid CR, Katz ML, Kobrin SC, Paskett ED. Human papillomavirus vaccine knowledge and hypothetical acceptance among women in Appalachia Ohio. *Vaccine* 2012;30(36):5349-57. <https://doi.org/10.1016/j.vaccine.2012.06.034>
- [292] Salmon DA, Moulton LH, Omer SB, DeHart MP, Stokley S, Halsey NA. Factors associated with refusal of childhood vaccines among parents of school-aged children: a case-control study. *Arch Pediatr Adolesc Med* 2005;159(5) 470-6. <https://doi.org/10.1001/archpedi.159.5.470>
- [293] Salmon DA, Sotir MJ, Pan WK, Berg JL, Omer SB, Stokley S, Hopfensperger DJ, Davis JP, Halsey NA. Parental vaccine refusal in Wisconsin: a case-control study. *WJM*, 2009;108(1):17-23.
- [294] Sam IC, Wong LP, Rampal S, Leong YH, Pang CF, Tai YT, Tee HC, Kahar-Bador M. Maternal acceptance of human papillomavirus vaccine in Malaysia. *J Adolesc Health* 2009;44(6) 610-2. <https://doi.org/10.1016/j.jadohealth.2008.11.014>
- [295] Sampson R, Wong L, Macvicar R. Parental reasons for non-uptake of influenza vaccination in young at-risk groups: a qualitative study. *Br J Gen Pract* 2011;61(588):e386-91. <https://doi.org/10.3399/bjgp11X583155>
- [296] Rickert VI, Rehm SJ, Aalsma MC, Zimet GD. The role of parental attitudes and provider discussions in uptake of adolescent vaccines. *Vaccine* 2015;33(5):642-7. <https://doi.org/10.1016/j.vaccine.2014.12.016>
- [297] Rose SB, Lawton BA, Lanumata TS, Hibma M, Baker MG. Predictors of intent to vaccinate against HPV/cervical cancer: a multi-ethnic survey of 769 parents in New Zealand. *N Z Med J* 2012;125(1350):51-62.
- [298] Santibanez TA, Kennedy ED. Reasons given for not receiving an influenza vaccination, 2011-12 influenza season, United States. *Vaccine* 2016;34(24):2671-8. <https://doi.org/10.1016/j.vaccine.2016.04.039>
- [299] Saqer A, Ghazal S, Barqawi H, Babi JA, Al Khafaji R, Elmekresh MM. Knowledge and Awareness about Cervical Cancer Vaccine (HPV) Among Parents in Sharjah. *Asian Pac J Cancer Prev* 2017;18(5):1237-41. <https://doi.org/10.22034/APJCP.2017.18.5.1237>

- [300] Schollin Ask L, Hjern A, Lindstrand A, Olen O, Sjogren E, Blennow M, Ortvist A. Receiving early information and trusting Swedish child health centre nurses increased parents' willingness to vaccinate against rotavirus infections. *Acta Paediatr* 2017;106(8):1309-16. <https://doi.org/10.1111/apa.13872>
- [301] Schwarz NG, Gysels M, Pell C, Gabor J, Schlie M, Issifou S, Lell B, Kreamsner PG, Grobusch MP, Pool R. Reasons for non-adherence to vaccination at mother and child care clinics (MC-Cs) in Lambarene, Gabon. *Vaccine* 2009;27(39):5371-5. <https://doi.org/10.1016/j.vaccine.2009.06.100>
- [302] Selmouni F, Zidouh A, Nejjari C, Bekkali R. Acceptability of the human papilloma virus vaccine among Moroccan parents: a population-based crosssectional study. *East Mediterr Health J* 2015;21(8):555-63. <https://doi.org/10.26719/2015.21.8.555>
- [303] Sengupta B, Sinha RN, Sarkar GN, Biswas AB, Mukherjee KL. Perception and practice regarding pulse polio immunisation in an urban community of Calcutta. *J Indian Med Assoc* 1998;96(8):247-8.
- [304] Seven M, Guvenc G, Sahin E, Akyuz A. Attitudes to HPV Vaccination among Parents of Children Aged 10 to 13 Years. *J Pediatr Adolesc Gynecol* 2015;28(5):382-6. <https://doi.org/10.1016/j.jpjg.2014.11.005>
- [305] Shao SJ, Nurse C, Michel L, Joseph MA, Suss AL. Attitudes and Perceptions of the Human Papillomavirus Vaccine in Caribbean and African American Adolescent boys and Their Parents. *J Pediatr Adolesc Gynecol* 2015;28(5): 373-7. <https://doi.org/10.1016/j.jpjg.2014.11.003>
- [306] Shapiro GK, Holding A, Perez S, Amsel R, Rosberger Z. Validation of the vaccine conspiracy beliefs scale. *Papillomavirus Res* 2016;2:167-72. <https://doi.org/10.1016/j.pvr.2016.09.001>
- [307] Shapiro GK, Perez S, Naz A, Tatar O, Guichon JR, Amsel R, Zimet GD, Rosberger Z. Investigating Canadian parents' HPV vaccine knowledge, attitudes and behaviour: a study protocol for a longitudinal national online survey. *BMJ Open* 2017; 7(10):e017814. <https://doi.org/10.1136/bmjopen-2017-017814>
- [308] Shawn DH, Gold R. Survey of parents' attitudes to the recommended Haemophilus influenzae type b vaccine program. *CMAJ* 1987;136(10):1038-40.
- [309] Sheikh A, Iqbal B, Ehtamam A, Rahim M, Shaikh HA, Usmani HA, Nasir J, Ali S, Zaki M, Wahab TA, Wasim W, Aftab AA. Reasons for non-vaccination in pediatric patients visiting tertiary care centers in a polio-prone country. *Arch Public Health* 2013;71(1):19. <https://doi.org/10.1186/0778-7367-71-19>
- [310] Shuaib FM, Kimbrough D, Roofe M, McGwin GJr, Jolly P. Factors associated with incomplete childhood immunization among residents in St. Mary, Jamaica. *West Indian Med J* 2010;59(5):549-54.
- [311] Skinner J, March L, Simpson JM. A retrospective cohort study of childhood immunisation status in northern Sydney. *Aust J Public Health* 1995;19(1):58-63. <https://doi.org/10.1111/j.1753-6405.1995.tb00298.x>
- [312] Smailbegovic MS, Laing GJ, Bedford H. Why do parents decide against immunization? The effect of health beliefs and health professionals. *Child Care Health Dev* 2003;29(4):303-11. <https://doi.org/10.1046/j.1365-2214.2003.00347.x>
- [313] Smith MJ, Woods CR, Marshall GS. Parental vaccine concerns in Kentucky. *J Ky Med Assoc* 2009;107(9):342-9.
- [314] Smith PJ, Humiston SG, Marcuse EK, Zhao Z, Dorell CG, Howes C, Hibbs B. Parental delay or refusal of vaccine doses, childhood vaccination coverage at 24 months of age, and the Health Belief Model. *Public Health Rep* 2011;126 Suppl 2:135-46. <https://doi.org/10.1177/00333549111260S215>
- [315] Smith PJ, Humiston SG, Parnell T, Vannice KS, Salmon DA. The association between intentional delay of vaccine administration and timely childhood vaccination coverage. *Public Health Rep* 2010;125(4):534-41. <https://doi.org/10.1177/003335491012500408>
- [316] Smith PJ, Kennedy AM, Wooten K, Gust DA, Pickering LK. Association between health care providers' influence on parents who have concerns about vaccine safety and vaccination coverage. *Pediatrics* 2006;118(5):e1287-92. <https://doi.org/10.1542/peds.2006-0923>
- [317] Smith PJ, Marcuse EK, Seward JF, Zhao Z, Orenstein WA. Children and Adolescents Unvaccinated Against Measles: Geographic Clustering, Parents' Beliefs, and Missed Opportunities. *Public Health Rep* 2015;130(5):485-504. <https://doi.org/10.1177/003335491513000512>
- [318] Smith PJ, Stokley S, Bednarczyk RA, Orenstein WA, Omer SB. HPV vaccination coverage of teen girls: the influence of health care providers. *Vaccine* 2016;34(13):1604-10. <https://doi.org/10.1016/j.vaccine.2016.01.061>
- [319] Sohail M, Mahmood B, Asim M. Mother's Knowledge, Attitude and Practices about child immunization: A study in district Faisalabad, Pakistan. *Rawal Medical Journal* 2015;40(4): 441-4.
- [320] Songthap A, Pitisuttithum P, Kaewkungwal J, Fungladda W, Bussaratid V. Knowledge, attitudes, and acceptability of a human papilloma virus vaccine among students, parents and teachers in Thailand. *Southeast Asian J Trop Med Public Health* 2012;43(2):340-53.
- [321] Soyer OU, Hudaverdiyev S, Civelek E, Isik E, Karabulut E, Kocabas C, Sekerel BE. Parental perspectives on influenza vaccination in children with asthma. *Pediatr Pulmonol* 2011;46(2): 139-44. <https://doi.org/10.1002/ppul.21332>
- [322] Staras SA, Vadaparampil ST, Patel RP, Shenkman EA. Parent perceptions important for HPV vaccine initiation among low income adolescent girls. *Vaccine* 2014;32(46):6163-9. <https://doi.org/10.1016/j.vaccine.2014.08.054>
- [323] Steel Fisher GK, Blendon RJ, Guirguis S, Brule A, Lasala-Blanco N, Coleman M, Petit V, Ahmed M, Mataruse N, Corkum M, Nisar M, Ben-Porath EN, Gigli S, Sahm, C. Threats to polio eradication in high-conflict areas in Pakistan and Nigeria: a polling study of caregivers of children younger than 5 years. *Lancet Infect Dis* 2015;15(10):1183-92. [https://doi.org/10.1016/S1473-3099\(15\)00178-4](https://doi.org/10.1016/S1473-3099(15)00178-4)
- [324] Stefanoff P, Mamelund SE, Robinson M, Netterlid E, Tuells J, Bergsaker MA, Heijbel H, Yarwood J, Europe V. Tracking parental attitudes on vaccination across European countries: The Vaccine Safety, Attitudes, Training and Communication Project (VACSATC). *Vaccine* 2010;28(35):5731-7. <https://doi.org/10.1016/j.vaccine.2010.06.009>
- [325] Stein Zamir C, Israeli A. Knowledge, Attitudes and Perceptions About Routine Childhood Vaccinations Among Jewish Ultra-Orthodox Mothers Residing in Communities with Low Vaccination Coverage in the Jerusalem District. *Matern Child Health J* 2017;21(5):1010-17. <https://doi.org/10.1007/s10995-017-2272-5>
- [326] Stephenson JD. Survey of parents' attitudes to the recommended Haemophilus influenzae type b vaccine program. *CMAJ*, 1987;137(5):371-2.
- [327] Stockwell MS, Irigoyen M, Andres Martinez R, Findley SE. Failure to return: parental, practice, and social factors affecting missed immunization visits for urban children. *Clin Pediatr (Phila)*, 2014; 53(5): 420-7. <https://doi.org/10.1177/0009922814527497>
- [328] Strelitz B, Gritton J, Klein EJ, Bradford MC, Follmer K, Zerr DM, Englund JA, Opel DJ. Parental vaccine hesitancy and acceptance of seasonal influenza vaccine in the pediatric emergency department. *Vaccine* 2015;33(15):1802-7. <https://doi.org/10.1016/j.vaccine.2015.02.034>
- [329] Stretch R, Roberts SA, McCann R, Baxter D, Chambers G, Kitchener H, Brabin L. Parental attitudes and information needs in an adolescent HPV vaccination programme. *Br J Cancer* 2008;99(11):1908-11. <https://doi.org/10.1038/sj.bjc.6604766>
- [330] Suarez-Castaneda E, Pezzoli L, Elas M, Baltrons R, Crespini-Elias EO, Pleitez OA, de Campos MI, Danovaro-Holliday MC. Routine childhood vaccination programme coverage, El Salvador, 2011-In search of timeliness. *Vaccine* 2014;32(4):437-44. <https://doi.org/10.1016/j.vaccine.2013.11.072>

- [331] Sundaram SS, Roberts C, Rowen D, Patel R. Parental attitudes towards the human papillomavirus vaccine in ethnic minorities: a community survey. *Int J STD AIDS* 2010;21(6):449. <https://doi.org/10.1258/ijsa.2010.010105>
- [332] Tadesse H, Deribew A, Woldie M. Predictors of defaulting from completion of child immunization in south Ethiopia, May 2008: a case control study. *BMC Public Health*,2009;9:150. <https://doi.org/10.1186/1471-2458-9-150>
- [333] Tagbo BN, Ughasoro MD, Esangbedo DO. Parental acceptance of inactivated polio vaccine in Southeast Nigeria: a qualitative cross-sectional interventional study. *Vaccine* 2014;32(46):6157-62. <https://doi.org/10.1016/j.vaccine.2014.08.053>
- [334] Taiwo L, Idris S, Abubakar A, Nguku P, Nsubuga P, Gidado S, Okeke L, Emiasegen S, Waziri E. Factors affecting access to information on routine immunization among mothers of under 5 children in Kaduna State Nigeria, 2015. *Pan Afr Med J* 2017; 27:186. <https://doi.org/10.11604/pamj.2017.27.186.11191>
- [335] Takahashi K, Kanda H, Kim JY. Reasons for Non-vaccination among Patients Who Acquired Measles: Lessons from the Local Measles Epidemics in Japan. *West Indian Med J* 2014;63(6):647-9. <https://doi.org/10.7727/wimj.2013.310>
- [336] Tam WW, Chan J, Lo KK, Lee A, Chan PK, Chan D, Nelson EA. Parental Attitudes and Factors Associated With Varicella Vaccination in Preschool and Schoolchildren in Hong Kong: A Cross-Sectional Study. *Medicine (Baltimore)* 2015;94(36):e1519. <https://doi.org/10.1097/MD.0000000000001519>
- [337] Tan TQ, Gerbie MV. Perception, Awareness, and Acceptance of Human Papillomavirus Disease and Vaccine Among Parents of Boys Aged 9 to 18 Years. *Clin Pediatr (Phila)* 2017;56(8):737-43. <https://doi.org/10.1177/0009922816682788>
- [338] Tang C, Huang S, Weng K, Ger L, Hsieh K. Parents' views about the vaccination program in Taiwan. *Pediatrics and neonatology* 2011;52(2):98-102
- [339] Taylor JA, Cufley D. The association between parental health beliefs and immunization status among children followed by private pediatricians. *Clin Pediatr (Phila)* 1996;35(1):18-22. <https://doi.org/10.1177/000992289603500104>
- [340] Taylor JA, Darden PM, Brooks DA, Hendricks JW, Wasserman RC, Bocian AB. Pediatric Research in Office, S., and National Medical, A., Association between parents' preferences and perceptions of barriers to vaccination and the immunization status of their children: a study from Pediatric Research in Office Settings and the National Medical Association. *Pediatrics*, 2002;110(6):1110-6. <https://doi.org/10.1542/peds.110.6.1110>
- [341] Thomas T, Blumling A, Delaney A. The Influence of Religiosity and Spirituality on Rural Parents' Health Decision Making and Human Papillomavirus Vaccine Choices. *ANS Adv Nurs Sci* 2015;38(4):E1-E12. <https://doi.org/10.1097/ANS.0000000000000094>
- [342] Thomas TL, Strickland OL, Di Clemente R, Higgins M, Haber M. Rural African American parents' knowledge and decisions about human papillomavirus vaccination. *J Nurs Scholarsh* 2012;44(4):358-67. <https://doi.org/10.1111/j.1547-5069.2012.01479.x>
- [343] Thomas TL, Strickland OL, Di Clemente R, Higgins M, Williams B, Hickey K. Parental Human Papillomavirus Vaccine Survey (PHPVS): nurse-led instrument development and psychometric testing for use in research and primary care screening. *J Nurs Meas* 2013;21(1):96-109. <https://doi.org/10.1891/1061-3749.21.1.96>
- [344] Thomas TL, Strickland OL, Higgins M. Mothers, Fathers, Sons, and Human Papillomavirus Immunization Practices. *Fam Community Health*,2017;40(3):278-87. <https://doi.org/10.1097/FCH.000000000000104>
- [345] Thompson EL, Rosen BL, Vamos CA, Kadono M, Daley EM. Human Papillomavirus Vaccination: What Are the Reasons for Nonvaccination Among U.S. Adolescents? *J Adolesc Health* 2017;61(3):288-93. <https://doi.org/10.1016/j.jadohealth.2017.05.015>
- [346] Tisi G, Salinaro F, Apostoli P, Bassani R, Bellicini A, Groppi L, Donarini P, Pecorelli S. HPV vaccination acceptability in young boys. *Ann Ist Super Sanita* 2013;49(3):286-91. https://doi.org/10.4415/ANN_13_03_09
- [347] Taylor JA, Newman RD. Parental attitudes toward varicella vaccination. *The Puget Sound Pediatric Research Network. Arch Pediatr Adolesc Med* 2000;154(3):302-6. <https://doi.org/10.1001/archpedi.154.3.302>
- [348] Wright RA, Battaglia M, Wilkinson M, Huggins VJ, Abt Associates. The National Immunization Survey: design of a study on knowledge, attitudes, and practices (NIS-KAP). Proceedings of the section on Survey Research Methods, Indianapolis. American Statistical Association, 2000:697-702.
- [349] Streng A, Seeger K, Grote V, Liese JG. Varicella vaccination coverage in Bavaria (Germany) after general vaccine recommendation in 2004. *Vaccine* 2010;28(35):5738-45. <https://doi.org/10.1016/j.vaccine.2010.06.007>
- [350] Opel DJ, Taylor JA, Mangione-Smith R, Solomon C, Zhao C, Catz S, Martin D. Validity and reliability of a survey to identify vaccine-hesitant parents. *Vaccine* 2011;29(38):6598-605. <https://doi.org/10.1016/j.vaccine.2011.06.115>
- [351] Austin Z, Sutton J. Qualitative research: getting started. *Can J Hosp Pharm* 2014;67(6):436-40. <https://doi.org/10.4212/cjhp.v67i6.1406>
- [352] Gianfredi V, Nucci D, Salvatori T, Orlacchio F, Villarini M, Moretti M, PerCEIVE IN UMBRIA STUDY GROUP. "PerCEIVE in Umbria": evaluation of anti-influenza vaccination's perception among Umbrian pharmacists. *J Prev Med Hyg* 2018;59(1):E14-E19. <https://doi.org/10.15167/2421-4248/jpmh2018.59.1.806>
- [353] Meadows KA. So you want to do research? 5: Questionnaire design. *Br J Community Nurs* 2003;8(12):562-70. <https://doi.org/10.12968/bjcn.2003.8.12.11854>
- [354] Keszei, A.P., Novak, M., and Streiner, D.L., Introduction to health measurement scales. *J Psychosom Res* 2016;68(4): 319-23. <https://doi.org/10.1016/j.jpsychores.2010.01.006>
- [355] Tabacchi G, Costantino C, Napoli G, Marchese V, Cracchiolo M, Casuccio A, Vitale F, The Esculapio Working Group. Determinants of European parents' decision on the vaccination of their children against measles, mumps and rubella: A systematic review and meta-analysis. *Hum Vaccin Immunother* 2016;12(7):1909-23. <https://doi.org/10.1080/21645515.2016.1151990>
- [356] Gualano MR, Bert F, Voglino G, Buttinelli E, D'Errico MM, De Waure C, Di Giovanni P, Fantini MP, Giuliani, AR, Marranzano M, Masanotti G, Massimi A, Nante N, Pennino F, Squeri R, Stefanati A, Signorelli C, Siliquini R. Attitudes towards compulsory vaccination in Italy: Results from the NAVIDAD multicentre study. *Vaccine* 2018;36(23):3368-3374. <https://doi.org/10.1016/j.vaccine.2018.04.029>
- [357] Gualano MR, Olivero E, Voglino G, Corezzi M, Rossello P, Vicentini C, Bert F, Siliquini R. Knowledge, attitudes and beliefs towards compulsory vaccination: a systematic review. *Hum Vaccin Immunother* 2019;15(4):918-31. <https://doi.org/10.1080/21645515.2018.1564437>
- [358] Gianfredi V, D'Ancona F, Maraglino F, Cenci C, Iannazzo S. Polio and measles: reasons of missed vaccination in Italy, 2015-2017. *Ann Ig* 2019;31(3):191-201. <https://doi.org/10.7416/ai.2019.2282>
- [359] Gianfredi V, Grisci C, Nucci D, Parisi V, Moretti M. [Communication in health.]. *Recenti Prog Med* 2018;109(7):374-83. <https://doi.org/10.1701/2955.29706>
- [360] Gianfredi V, Odone A, Fiacchini D, Rosselli R, Battista T, Signorelli C. Trust and reputation management, branding, social media management nelle organizzazioni sanitarie: sfide e opportunità per la comunità igienistica italiana. *J Prev Med Hyg* 2019;60(3):E108-E109.
- [361] Bragazzi NL, Barberis I, Rosselli R, Gianfredi V, Nucci D, Moretti M, Salvatori T, Martucci G, Martini M. How often

- people google for vaccination: Qualitative and quantitative insights from a systematic search of the web-based activities using Google Trends. *Hum Vaccin Immunother* 2017;13(2):464-9. <https://doi.org/10.1080/21645515.2017.1264742>
- [362] Bragazzi NL, Gianfredi V, Villarini M, Rosselli R, Nasr A, Hussein A, Martini M, Behzadifar M. Vaccines Meet Big Data: State-of-the-Art and Future Prospects. From the Classical 3Is ("Isolate-Inactivate-Inject") Vaccinology 1.0 to Vaccinology 3.0, Vaccinomics, and Beyond: A Historical Overview. *Front Public Health* 2018;6:62. <https://doi.org/10.3389/fpubh.2018.00062>
- [363] Gianfredi V, Bragazzi NL, Mahamid M, Bisharat B, Mahroum N, Amital H, Adawi M. Monitoring public interest toward pertussis outbreaks: an extensive Google Trends-based analysis. *Public Health* 2018;165:9-15. <https://doi.org/10.1016/j.puhe.2018.09.001>
- [364] Kazi AM, Khalid W. Questionnaire designing and validation. *J Pak Med Assoc* 2012;62(5):514-6.
- [365] Gianfredi V, Nucci D, Ceccarelli F, Villarini M, Moretti M. PILATES (Physical Activity and Diet Survey): An Italian Self-Administered Questionnaire Evaluating Diet Habits of Gym-Goers. Validation Process. *J Diet Suppl* 2019;16(3):307-17. <https://doi.org/10.1080/19390211.2018.1456501>
- [366] Nucci D, Licitra L, Sciarra S, Moretti M, Gianfredi V. PRuNUS: design and validation of a questionnaire among prisoners - data of pilot study in the Penitentiary Institute of Perugia, Italy. *Int J Prison Health* 2019;16(2):165-83. <https://doi.org/10.1108/IJPH-01-2019-0001>
- [367] Cuda A, Gentile L, Voglino G, Gianfredi V. and Gruppo di lavoro Vaccini e Vaccine Hesitancy Consulta degli Specializzandi, SII, [Design and validation of a questionnaire for assessing Public Health residents' opinions and knowledge regarding the new mandatory vaccination law in Italy (DL 73/2017)]. *Ig Sanita Pubbl*,2018;74(2):137-52.
- [368] Derrough T, Olsson K, Gianfredi V, Simondon F, Heijbel H, Danielsson N, Kramarz P, Pastore-Celentano L. Immunisation Information Systems - useful tools for monitoring vaccination programmes in EU/EEA countries, 2016. *Euro Surveill* 2017;22(17). <https://doi.org/10.2807/1560-7917.ES.2017.22.17.30519>
- [369] Gianfredi V, Balzarini F, Gola M, Mangano S, Carpagnano LF, Colucci ME, Gentile L, Piscitelli A, Quattrone F, Scuri S, Mantovani LG, Auxilia F, Castaldi S, Capolongo S, Pelissero G, Odone A, Signorelli C. Leadership in Public Health: Opportunities for Young Generations Within Scientific Associations and the Experience of the "Academy of Young Leaders". *Front Public Health* 2019;7:378. <https://doi.org/10.3389/fpubh.2019.00378>
- [370] Gianfredi V, Moretti M, Lopalco PL. Countering vaccine hesitancy through immunization information systems, a narrative review. *Hum Vaccin Immunother* 2019;1-19. <https://doi.org/10.1080/21645515.2019.1599675>

Received on December 9, 2019. Accepted on July 22, 2020.

Correspondence: Ilaria Barberis, Health Science Department, University of Genoa, largo Rosanna Benzi 10, Pad. 3 San Martino Hospital, Italy - Tel./Fax +39 010 3538502 - E-mail: ilaria.barberis@edu.unige.it

How to cite this article: Cella P, Voglino G, Barberis I, Alagna E, Alessandrini C, Cuda A, D'Aloisio F, Dallagiacoma G, De Nitto S, Di Gaspare F, Gallipoli O, Gentile L, Kundisov L, Navaro M, Provenzano S, Santangelo OE, Stefanizzi P, Gianfredi V. Resources for assessing parents' vaccine hesitancy: a systematic review of the literature. *J Prev Med Hyg* 2020;61:E340-E373. <https://doi.org/10.15167/2421-4248/jpmh2020.61.3.1448>

© Copyright by Pacini Editore Srl, Pisa, Italy

This is an open access article distributed in accordance with the CC-BY-NC-ND (Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International) license. The article can be used by giving appropriate credit and mentioning the license, but only for non-commercial purposes and only in the original version. For further information: <https://creativecommons.org/licenses/by-nc-nd/4.0/deed.en>