Supplementary Materials

Implementation Challenges and Real-World Impacts of Switching Pediatric Vaccines: A Global Systematic Literature Review

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Appendix S1 PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Title
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Abstract
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Background; paragraph 1-3
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Background; paragraph 3
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Materials and methods; eligibility criteria
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Materials and methods; search strategy and selection process
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Appendix; table S2
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Materials and methods; search strategy and selection process
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Materials and methods; data extraction
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Materials and methods; data extraction
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Not Applicable
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Materials and methods; quality assessment
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Not Applicable
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Materials and methods; search strategy and selection process
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Not Applicable

Section and Topic	Item #	Checklist item	Location where item is reported
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Materials and methods; data synthesis
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Materials and methods; data synthesis
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Materials and methods; data synthesis
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Not Applicable
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Not Applicable
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Not Applicable
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Results, Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Appendix S3
Study characteristics	17	Cite each included study and present its characteristics.	Table 1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Appendix; table S4-6
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Table 1
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Results, Table 1, Appendix table S4-6
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Not Applicable
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Not Applicable
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Not Applicable
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Not Applicable
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Not Applicable
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Discussion; paragraph 1-8
	23b	Discuss any limitations of the evidence included in the review.	Discussion; limitation
	23c	Discuss any limitations of the review processes used.	Discussion; limitation
	23d	Discuss implications of the results for practice, policy, and future research.	Discussion; limitation

Section and Topic	Item #	Checklist item	Location where item is reported
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Materials and methods; paragraph 3
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Materials and methods; paragraph 3
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Not Applicable
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Disclaimers; funding
Competing interests	26	Declare any competing interests of review authors.	Disclaimers; declaration of interest statement
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Not Applicable

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: http://www.prisma-statement.org/

Appendix S2 Full search strategies

From database inception to April 30, 2022

Database	Search term	Results
PubMed	(Child* OR Infant* OR Pediatric* OR Paediatric*) AND (Vaccines[MeSH] OR Vaccin*[tiab] OR Immunis*[tiab] OR Immuniz*[tiab] OR inoculat*) AND Switch*[tiab]	705
EMBASE	(child* OR infant* OR pediatric* OR paediatric*) AND (vaccin*:ti,ab OR immunis*:ti,ab OR immuniz*:ti,ab OR inoculat*:ti,ab) AND switch*:ti,ab AND [embase]/lim	891
CENTRAL	(child* OR infant* OR pediatric* OR paediatric*) AND (vaccin* OR immunis* OR immuniz* OR inoculat) AND switch* in All Text	71
LILACS	Vaccine AND Switch	7
Total		**1,674**

Additional search for grey literature

Search date	Source	Keywords	Hits	Included reports
12/21/2022	OpenGrey	(Vaccine OR Immunization) AND Switch	1	0
12/21/2022	EBSCO Open Dissertations	(Vaccine OR Immunization) AND Switch	43	0
12/21/2022	World Health Organization (WHO) (www.who.int)	Switch	55	0
12/21/2022	WHO European Region (EURO) (www.who.int/europe/)	Switch	19	1
12/21/2022	WHO Eastern Mediterranean Region (EMRO) (www.emro.who.int/)	Switch	Database is not working	0
12/21/2022	WHO Western Pacific Region (WPRO) (https://www.who.int/westernpacific)	Switch	34	0
12/22/2022	WHO South-East Asia Region (SEAR) (https://www.who.int/southeastasia/)	Switch	39	0

12/22/2022	WHO Pan American Health Organization (PAHO) (https://www.paho.org/en)	vaccin AND "switch" AND pediatric	540	1
12/22/2022	WHO African Region (AFRO)	vaccin AND "switch" AND pediatric	460	2
Total				3

Appendix S3 Excluded studies with reasons

First Author	Year Published	Title
No challenges of vaccine switch mentioned		
Abba B.	2018	Mobilizing political support proved critical to a successful switch from tOPV to bOPV in Kano, Nigeria 2016
Abbott S.	2022	Reassessing the evidence for universal school-age BCG vaccination in England and Wales: Re-evaluating and updating a modelling study
Adetifa I. M.	2012	Pre-vaccination nasopharyngeal pneumococcal carriage in a Nigerian population: epidemiology and population biology
Ahmad M.	2016	Cross-sectional Serologic Assessment of Immunity to Poliovirus in Differential Risk Areas of India: India Seroprevalence Survey - 2014
Ahmad M.	2021	Poliomyelitis seroprevalence in high risk populations of India before the trivalent to bivalent oral poliovirus vaccine switch in 2016
Aljunid S. M.	2022	Economic impact of switching from partially combined vaccine "Pentaxim® and hepatitis B" to fully combined vaccine "Hexaxim®" in the Malaysian National Immunization Program
Alleman M. M.	2020	Update on Vaccine-Derived Poliovirus Outbreaks - Worldwide, July 2019-February 2020
Alrabiaah A. A.	2012	Outbreak of Bacille Calmette-Guérin-related lymphadenitis in Saudi children at a university hospital after a change in the strain of vaccine
Altamirano J.	2018	OPV Vaccination and Shedding Patterns in Mexican and US Children
Alvarez A. M. R.	2017	The evolution of Vaccination Week in the Americas
Amiche A.	2021	Cost Utility of Switching From Trivalent to Quadrivalent Influenza Vaccine in Turkey
Andrade A. L.	2010	Non-typeable Streptococcus pneumoniae carriage isolates genetically similar to invasive and carriage isolates expressing capsular type 14 in Brazilian infants
Angoulvant F.	2014	Early impact of 13-valent pneumococcal conjugate vaccine on community-acquired pneumonia in children
Ansaldi F.	2020	Estimating the clinical and economic impact of switching from the 13-valent pneumococcal conjugate vaccine (PCV13) to the 10-valent pneumococcal conjugate vaccine (PCV10) in Italy
Ansaldi F.	2011	Increasing incidence of Streptococcus pneumoniae serotype 19A and emergence of two vaccine escape recombinant ST695 strains in Liguria, Italy, 7 years after implementation of the 7-valent conjugated vaccine
Asai N.	2019	A severe case of Streptococcal pyogenes empyema following influenza A infection

First Author	Year Published	Title
Asogwa O. A.	2022	Impact of 7-valent versus 10-valent pneumococcal conjugate vaccines on primary care consultations across various age groups in the Netherlands, 5 years after the switch: A time-series analysis
Assi T. M.	2011	Impact of changing the measles vaccine vial size on Niger's vaccine supply chain: a computational model
Avigan D.	2001	Vaccination against infectious disease following hematopoietic stem cell transplantation
Avila-Agüero M. L.	2022	Epidemiology of pertussis in Costa Rica and the impact of vaccination: A 58-year experience (1961-2018)
Ayouni K.	2020	Hepatitis a virus infection in Central-West Tunisia: An age structured model of transmission and vaccination impact
Bahl S.	2016	Fractional-Dose Inactivated Poliovirus Vaccine Immunization Campaign - Telangana State, India, June 2016
Balmer P.	2002	Impact of meningococcal C conjugate vaccine in the UK
Barlan I. B.	2005	Role of bacillus Calmette-Guérin as an immunomodulator for the prevention and treatment of allergy and asthma
Bart M. J.	2014	Global population structure and evolution of Bordetella pertussis and their relationship with vaccination
Bauch C. T.	2007	Cost-utility of universal hepatitis A vaccination in Canada
Baxendale H. E.	2008	Natural human antibodies to pneumococcus have distinctive molecular characteristics and protect against pneumococcal disease
Beall B.	2018	A population-based descriptive atlas of invasive pneumococcal strains recovered within the U.S. During 2015-2016
Becker N. G.	1996	Simultaneous control of measles and rubella by multidose vaccination schedules
Bellier L.	2021	Cost-effectiveness analysis of switching from a trivalent to a quadrivalent inactivated influenza vaccine in the Peruvian immunisation programme
Bencina G.	2022	Recommendations and Health Technology Assessment (HTA) landscape evaluation for pediatric pneumococcal conjugate vaccines (PCV) in Europe: a systematic literature review
Berbers G. A. M.	2009	Improving pertusis vaccination
Bianculli P. M.	2022	Switching from trivalent to quadrivalent inactivated influenza vaccines in Uruguay: a cost-effectiveness analysis
Bijlsma M. W.	2014	Epidemiology of invasive meningococcal disease in the Netherlands, 1960-2012: An analysis of national surveillance data
Boccalini S.	2017	Hospitalizations for pneumonia, invasive diseases and otitis in Tuscany (Italy), 2002-2014: Which was the impact of universal pneumococcal pediatric vaccination?

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Borkowsky W.	1987	Antibody responses to bacterial toxoids in children infected with human immunodeficiency virus
Bosch A.	2016	Nasopharyngeal carriage of Streptococcus pneumoniae and other bacteria in the 7th year after implementation of the pneumococcal conjugate vaccine in the Netherlands
Brickley E. B.	2017	Vaccine-induced mucosal immunity from ipv-bopv and ipv-only immunization schedules: Analysis of an open-label, randomized controlled trial in Chilean infants
Brisson M.	2016	Health and Economic Impact of Switching from a 4-Valent to a 9-Valent HPV Vaccination Program in the United States
Brueggemann A. B.	2013	Population genetic structure of Streptococcus pneumoniae in Kilifi, Kenya, prior to the introduction of pneumococcal conjugate vaccine
Brueggemann A. B.	2007	Vaccine escape recombinants emerge after pneumococcal vaccination in the United States
Brugger S. D.	2010	Multiple colonization with S. pneumoniae before and after introduction of the seven-valent conjugated pneumococcal polysaccharide vaccine
Byington C. L.	2010	Molecular epidemiology of pediatric pneumococcal empyema from 2001 to 2007 in Utah
Callaway E.	2013	Vaccine switch urged for polio endgame
Capeding M. R.	2014	Interchangeability of Quinvaxem during primary vaccination schedules: results from a phase IV, single-blind, randomized, controlled, single-center, non-inferiority study
Capra G.	2017	Potential impact of a nonavalent HPV vaccine on HPV related low-and high-grade cervical intraepithelial lesions: A referral hospital-based study in Sicily
Castañeda-Orjuela C.	2018	How cost effective is switching universal vaccination from PCV10 to PCV13? A case study from a developing country
Cata-Preta B. O.	2021	Patterns in Wealth-related Inequalities in 86 Low- and Middle-Income Countries: Global Evidence on the Emergence of Vaccine Hesitancy
Chaguza C.	2017	Population genetic structure, antibiotic resistance, capsule switching and evolution of invasive pneumococci before conjugate vaccination in Malawi
Chard A. N.	2021	Estimation of oral poliovirus vaccine effectiveness in Afghanistan, 2010-2020
Chen W.	2004	No evidence for links between autism, MMR and measles virus
Chen Z.	2017	Immune persistence after pertussis vaccination
Chiba N.	2011	Current status of invasive pneumococcal diseases and the preventive pneumococcal vaccines in Japan
Choi Y. H.	2012	Mathematical modelling long-term effects of replacing prevnar7 with prevnar13 on invasive pneumococcal diseases in england and wales

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Chrapkowska C.	2020	Validation of the new Swedish vaccination register - Accuracy and completeness of register data
Christensen K. K.	1985	Immune response to pneumococcal vaccine in mothers to infants with group B streptococcal septicemia: Evidence for a divergent IgG/IgM ratio
Ciapponi A.	2019	Sequential inactivated (IPV) and live oral (OPV) poliovirus vaccines for preventing poliomyelitis
Claes C.	2009	Cost-effectiveness of switching strategies from A 7-valent to A 13-valent pneumococcal conjugate vaccine
Clutterbuck E. A.	2008	Serotype-specific and age-dependent generation of pneumococcal polysaccharide-speciflc memory B-cell and antibody responses to immunization with a pneumococcal conjugate vaccine
Cremers A. J.	2015	The post-vaccine microevolution of invasive Streptococcus pneumoniae
Crépey P.	2020	From trivalent to quadrivalent influenza vaccines: Public health and economic burden for different immunization strategies in Spain
Crépey P.	2020	Impact of quadrivalent influenza vaccines in Brazil: a cost-effectiveness analysis using an influenza transmission model
Croucher N. J.	2013	Population genomics of post-vaccine changes in pneumococcal epidemiology
Croucher N. J.	2015	Selective and genetic constraints on pneumococcal serotype switching
Cuba IPV Study Collaborative Group	2007	Randomized, placebo-controlled trial of inactivated poliovirus vaccine in Cuba
Dagan R.	2011	Pneumococcal conjugate vaccines as a probe for better understanding pneumococcal respiratory infections
Davies E. G.	2004	Pneumococcal vaccines for sickle cell disease
Davis B.	2022	A method for estimating the impact of new vaccine technologies on vaccination coverage rates
De Graeve D.	2004	Economic aspects of pneumococcal pneumonia: A review of the literature
de Los Santos A. M.	2020	Can two different pneumococcal conjugate vaccines be used to complete the infant vaccination series? A randomized trial exploring interchangeability of the 13-valent pneumococcal conjugate vaccine and the pneumococcal non-typeable Haemophilus influenzae protein D-conjugate vaccine
de Onis M.	2013	Update on the implementation of the WHO child growth standards
De Wals P.	2017	Cost-effectiveness Comparison of Monovalent C Versus Quadrivalent ACWY Meningococcal Conjugate Vaccination in Canada
DeAngelis H.	2016	Epidemiological and Economic Effects of Priming With the Whole-Cell Bordetella pertussis Vaccine
Debellut F.	2020	Introduction of rotavirus vaccination in Palestine: An evaluation of the costs, impact, and cost-effectiveness of ROTARIX and ROTAVAC

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Degiuseppe J. I.	2020	Genotype distribution of Group A rotavirus in children before and after massive vaccination in Latin America and the Caribbean: Systematic review
Delea T. E.	2017	Cost-effectiveness of alternate strategies for childhood immunization against meningococcal disease with monovalent and quadrivalent conjugate vaccines in Canada
Deml M. J.	2022	Trust, affect, and choice in parents' vaccination decision-making and health-care provider selection in Switzerland
Dempsey A. F.	2011	Alternative vaccination schedule preferences among parents of young children
Deng X.	2015	Genetic Analysis of Invasive Pneumococcal Isolates from Children in Ontario, Canada, 2007-2012
Desmet S.	2021	Dynamic changes in paediatric invasive pneumococcal disease after sequential switches of conjugate vaccine in Belgium: a national retrospective observational study
Desmet S.	2021	In-depth analysis of pneumococcal serotypes in Belgian children (2015-2018): Diversity, invasive disease potential, and antimicrobial susceptibility in carriage and disease
Desmet S.	2018	Switch in a childhood pneumococcal vaccination programme from PCV13 to PCV10: a defendable approach?
Desmet S.	2018	Switch in childhood pneumococcal vaccine in Belgium
Devine A.	2017	Strategies for the prevention of perinatal hepatitis B transmission in a marginalized population on the Thailand-Myanmar border: a cost-effectiveness analysis
Di Pietro G. M.	2022	Meningococcal Disease in Pediatric Age: A Focus on Epidemiology and Prevention
Diks A. M.	2022	Age and Primary Vaccination Background Influence the Plasma Cell Response to Pertussis Booster Vaccination
Dintzis R. Z.	1992	Rational design of conjugate vaccines
Dobay O.	2010	Genotypic and phenotypic characterisation of invasive Streptococcus pneumoniae isolates from Hungary, and coverage of the conjugate vaccines
Dobay O.	2008	The effect of the 7-valent conjugate vaccine (PCV7) on the incidence of pneumococcal infections world-wide
Dore D. D.	2012	Vaccine discontinuation and switching following regulatory interventions in response to rotavirus vaccine contamination with porcine circovirus DNA fragments
Dorji T.	2015	Introduction of a National HPV vaccination program into Bhutan
Drolet M.	2021	Optimal human papillomavirus vaccination strategies to prevent cervical cancer in low-income and middle-income countries in the context of limited resources: a mathematical modelling analysis

First Author	Year Published	Title
Drolet M.	2013	Vaccinating Girls and Boys with Different Human Papillomavirus Vaccines: Can It Optimise Population-Level Effectiveness?
Duintjer Tebbens R. J.	2016	Implementation of coordinated global serotype 2 oral poliovirus vaccine cessation: risks of inadvertent trivalent oral poliovirus vaccine use
Durham D. P.	2016	National- and state-level impact and cost-effectiveness of nonavalent HPV vaccination in the United States
Eisen S.	2016	B-cell development and pneumococcal immunity in vertically acquired HIV infection
Elas M.	2021	Disproportionality analysis of reported drug adverse events to assess a potential safety signal for pentavalent vaccine in 2019 in El Salvador
Elberse K. E.	2012	Changes in the composition of the pneumococcal population and in IPD incidence in The Netherlands after the implementation of the 7-valent pneumococcal conjugate vaccine
Elberse K. E.	2016	Pneumococcal population in the era of vaccination: changes in composition and the relation to clinical outcomes
Enkel S. L.	2018	'Hesitant compliers': Qualitative analysis of concerned fully-vaccinating parents
Estivariz C. F.	2022	Review of use of inactivated poliovirus vaccine in campaigns to control type 2 circulating vaccine derived poliovirus (cVDPV) outbreaks
Everett D. B.	2012	Genetic characterisation of Malawian pneumococci prior to the roll-out of the PCV13 vaccine using a high-throughput whole genome sequencing approach
Falleiros-Arlant L. H.	2014	The challenge of changing the inactivated poliomyelitis vaccine in Latin America: declaration of the Latin American Society of Pediatric Infectious Diseases (SLIPE)
Fathima P.	2019	Effectiveness of rotavirus vaccines in an Australian population: A case-control study
Fatiregun A.	2020	Field investigation and response to a vaccine-derived poliovirus pre-topv switch in Southwest Nigeria, October 2015
Fedoseenko M. V.	2021	Prevalence of Allergic Diseases in Children Vaccinated against Tuberculosis and Hepatitis B in the Early Neonatal Period: Literature Review
Finn A.	2000	Time to switch from whole cell to acellular pertussis vaccines?
Florindo C.	2014	Epidemiological surveillance of colonising group B Streptococcus epidemiology in the Lisbon and Tagus Valley regions, Portugal (2005 to 2012): emergence of a new epidemic type IV/clonal complex 17 clone
Fortanier A. C.	2018	Outpatient antibiotic use in Dutch infants after 10-valent pneumococcal vaccine introduction: A time-series analysis
Galil K.	1999	Reemergence of invasive Haemophilus influenzae type b disease in a well-vaccinated population in remote Alaska

First Author	Year Published	Title
Gamage D.	2015	Achieving high seroprevalence against polioviruses in Sri Lanka—Results from a serological survey, 2014
García A.	2016	Cost–effectiveness analysis of quadrivalent influenza vaccine in Spain
Geier D. A.	2002	Clinical implications of endotoxin concentrations in vaccines
Gertz Jr R. E.	2003	Clonal distribution of invasive pneumococcal isolates from children and selected adults in the United States prior to 7-valent conjugate vaccine introduction
Gherardi G.	2009	Population structure of invasive Streptococcus pneumoniae isolates in Italy prior to the implementation of the 7-valent conjugate vaccine (1999-2003)
Glover M. T.	1992	A double-blind controlled trial of hyposensitization to Dermatophagoides pteronyssinus in children with atopic eczema
Goldhaber-Fiebert J. D.	2008	Cost-effectiveness of cervical cancer screening with human papillomavirus DNA testing and HPV-16,18 vaccination
Gopal K.	2010	Epidemiology and management of hepatitis B in women of childbearing age at an Urban medical center
Grassly N. C.	2006	New strategies for the elimination of polio from India
Greene S. A.	2019	Progress Toward Polio Eradication - Worldwide, January 2017-March 2019
Griffin M. R.	2014	Declines in pneumonia hospitalizations of children aged <2 years associated with the use of pneumococcal conjugate vaccines - Tennessee, 1998-2012
Griffiths U. K.	2009	Incremental system costs of introducing combined DTwP-hepatitis B-Hib vaccine into national immunization services in Ethiopia
Griffiths U. K.	2006	The cost-effectiveness of alternative polio immunization policies in South Africa
Grover M.	2015	India’s last battle in the war against polio
Guiso N.	2017	Whooping cough surveillance in France in pediatric private practice in 2006-2015
Hanage W. P.	2011	Carried pneumococci in Massachusetts children: The contribution of clonal expansion and serotype switching
Hanke C. R.	2015	Impact of PCV7 on nasopharyngeal density, serotype distribution and antibiotic resistance of pneumococcal strains isolated from peruvian children
Harrison L. H.	2010	Population structure and capsular switching of invasive neisseria meningitidis isolates in the pre-meningococcal conjugate vaccine Era - United States, 2000-2005
Hawken S.	2012	Underestimating the safety benefits of a new vaccine: the impact of acellular pertussis vaccine versus whole-cell pertussis vaccine on health services utilization
Hay C. R.	2006	The epidemiology of factor VIII inhibitors
Heininger U.	2016	Comparative Epidemiologic Characteristics of Pertussis in 10 Central and Eastern European Countries, 2000-2013
Hekimoğlu C. H.	2018	Seroprevalence and social determinants of varicella in Turkey

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Herzog C.	2015	Changing from whole-cell to acellular pertussis vaccines would trade superior tolerability for inferior protection
Hollinger F. B.	1987	Hepatitis B vaccines--to switch or not to switch
Hougs L.	1999	The first dose of a Haemophilus influenzae type b conjugate vaccine reactivates memory b cells: Evidence for extensive clonal selection, intraclonal affinity maturation, and multiple isotype switches to IgA2
Hovi T.	2001	Inactivated poliovirus vaccine and the final stages of poliovirus eradication
Hsieh Y. C.	2008	The transforming Streptococcus pneumoniae in the 21st century
Hsu H. M.	2001	Efficacy of a mass hepatitis B immunization program after switching to recombinant hepatitis B vaccine: A population-based study in Taiwan
Huang Q. S.	2005	Persistence of oral polio vaccine virus after its removal from the immunisation schedule in New Zealand
Huang S. W.	2014	Mutations in the non-structural protein region contribute to intra-genotypic evolution of enterovirus 71
Huang W. T.	2017	Vaccination and unexplained sudden death risk in Taiwanese infants
Ilboudo P. G.	2022	The economic impact of the switch from single- to multi-dose PCV13 vial in Benin
Iroh Tam P. Y.	2016	An ecological analysis of pertussis disease in Minnesota, 2009-2013
Iskedjian M.	2010	Economic impact of the introduction of an acellular pertussis vaccine in Canada: A 6-year analysis
Iwata S.	2021	Drastic reduction in pneumococcal meningitis in children owing to the introduction of pneumococcal conjugate vaccines: Longitudinal analysis from 2002 to 2016 in Japan
Izurieta P.	2018	Interpretation of the switch in a childhood pneumococcal vaccination programme from PCV13 to PCV10 in Belgium
Jackson C. G.	1979	Immune response of a patient with deficiency of the fourth component of complement and systemic lupus erythematosus
Jackson M. L.	2012	Modeling insights into Haemophilus influenzae type b disease, transmission, and vaccine programs
Jia L.	2021	Payment methods for healthcare providers working in outpatient healthcare settings
Jin L.	1999	Genetic heterogeneity of mumps virus in the United Kingdom: identification of two new genotypes
Kalkowska D. A.	2015	Modeling options to manage type 1 wild poliovirus imported into Israel in 2013
Kanungo S.	2017	Comparison of IPV to tOPV week 39 boost of primary OPV vaccination in Indian infants: an open labelled randomized controlled trial

First Author	Year Published	Title
Kersellius G. D.	2020	Respiratory pathogen surveillance trends and influenza vaccine effectiveness estimates for the 2018-2019 season among Department of Defense beneficiaries
Khan M. M.	2008	Economics of polio vaccination in the post-eradication era: Should OPV-using countries adopt IPV?
Khaskhely N.	2012	Phenotypic analysis of pneumococcal polysaccharide-specific B cells
Kind A. B.	2020	Assessing the epidemiological impact on cervical cancer of switching from 4-valent to 9-valent HPV vaccine within a gender-neutral vaccination programme in Switzerland
Klar S.	2014	Vaccine safety implications of Ontario, Canada's switch from DTaP-IPV to Tdap-IPV for the pre-school booster
Klein J. O.	2002	Management of the febrile child without a focus of infection in the era of universal pneumococcal immunization
Klein N. P.	2013	Comparative effectiveness of acellular versus whole-cell pertussis vaccines in teenagers
Klugman K. P.	2011	Contribution of vaccines to our understanding of pneumococcal disease
Ko E. J.	2018	Immunology and efficacy of MF59-adjuvanted vaccines
Kraśnicka J.	2018	Mandatory and recommended vaccinations in Poland in the views of parents
Kristiansen P. A.	2013	Phenotypic and genotypic characterization of meningococcal carriage and disease isolates in Burkina Faso after mass vaccination with a serogroup a conjugate vaccine
Krudwig K.	2020	The effects of switching from 10 to 5-dose vials of MR vaccine on vaccination coverage and wastage: A mixed-method study in Zambia
Kumar G.	2013	Estimating the cost impact of switching from a vial to a pre-filled syringe mode of administration for the dta a-IPV-HIB '5-in-1' vaccine in infants
Lai F. Y.	2016	Economic impact of switching rubella IgG methodologies to the prenatal public health program in Alberta
Landy R.	2018	What cervical screening is appropriate for women who have been vaccinated against high risk HPV? A simulation study
Largeron N.	2017	An estimate of the public health impact and cost-effectiveness of universal vaccination with a 9-valent HPV vaccine in Germany
Le Saux N.	2003	Decrease in hospital admissions for febrile seizures and reports of hypotonic-hyporesponsive episodes presenting to hospital emergency departments since switching to acellular pertussis vaccine in Canada: a report from IMPACT
Lee B. Y.	2017	Economic impact of thermostable vaccines
Lee S.	2015	Effective long-term prophylaxis against de novo hepatitis b with hepatitis b vaccination in pediatric recipients of HBcAB-positive liver grafts
Li J.	2018	Meningococcal disease and control in China: Findings and updates from the Global Meningococcal Initiative (GMI)

First Author	Year Published	Title
Li J.	2021	Seroprevalence of poliovirus antibodies before and after polio vaccine switch in 2012 and 2017 in Beijing
Li X.	1998	Protection against respiratory syncytial virus infection by DNA immunization
Lindsey B. B.	2019	Effect of a Russian-backbone live-attenuated influenza vaccine with an updated pandemic H1N1 strain on shedding and immunogenicity among children in The Gambia: an open-label, observational, phase 4 study
Lipsitch M.	2007	Strain characteristics of Streptococcus pneumoniae carriage and invasive disease isolates during a cluster-randomized clinical trial of the 7-valent pneumococcal conjugate vaccine
Litt D. J.	2009	Changes in genetic diversity of the Bordetella pertussis population in the United Kingdom between 1920 and 2006 reflect vaccination coverage and emergence of a single dominant clonal type
Liu J.	2021	Bile Acids Impair Vaccine Response in Children With Biliary Atresia
Locht C.	2016	Pertussis: Where did we go wrong and what can we do about it?
Loman N. J.	2013	Clonal expansion within pneumococcal serotype 6C after use of seven-valent vaccine
Lopez L. M.	2015	Education for contraceptive use by women after childbirth
Løvlie A.	2020	Changes in pneumococcal carriage prevalence and factors associated with carriage in Norwegian children, four years after introduction of PCV13
Macklin G. R.	2019	Vaccine schedules and the effect on humoral and intestinal immunity against poliovirus: a systematic review and network meta-analysis
Mahumud R. A.	2020	Cost-effectiveness evaluations of the 9-Valent human papillomavirus (HPV) vaccine: Evidence from a systematic review
Makwana A.	2018	Rapid Spread of Pneumococcal Nonvaccine Serotype 7C Previously Associated with Vaccine Serotype 19F, England and Wales
Manaseki S.	1993	Mongolia: a health system in transition
Margeridon S.	2005	A quasi-monoclonal anti-HBs response can lead to immune escape of 'wild-type' hepatitis B virus
Marin M.	2017	Guidance for Assessment of Poliovirus Vaccination Status and Vaccination of Children Who Have Received Poliovirus Vaccine Outside the United States
Marshall G. S.	2004	One for all: newer combination vaccines in practice
Matrajt L., Jr.	2010	Optimizing vaccine allocation at different points in time during an epidemic
Matuschewski K.	2011	Arrested Plasmodium liver stages as experimental anti-malaria vaccines
Mbaeyi C.	2018	Strategic Response to an Outbreak of Circulating Vaccine-Derived Poliovirus Type 2 - Syria, 2017-2018

First Author	Year Published	Title
Mbuagbaw L.	2015	Health system and community level interventions for improving antenatal care coverage and health outcomes
McChlery S. M.	2005	Clonal analysis of invasive pneumococcal isolates in Scotland and coverage of serotypes by the licensed conjugate polysaccharide pneumococcal vaccine: Possible implications for UK vaccine policy
McEllistrem M. C.	2003	Epidemiology of acute otitis media caused by Streptococcus pneumoniae before and after licensure of the 7-valent pneumococcal protein conjugate vaccine
McLean A. R.	1991	Model-based comparisons of measles immunization strategies using high dose Edmonston-Zagreb type vaccines
Meacham R. K.	2017	Comparison of cidofovir and the measles, mumps, and rubella vaccine in the treatment of recurrent respiratory papillomatosis
Mennini F. S.	2018	Cost-effectiveness of switching from trivalent to quadrivalent inactivated influenza vaccines for the at-risk population in Italy
Mera R.	2008	Serotype replacement and multiple resistance in Streptococcus pneumoniae after the introduction of the conjugate pneumococcal vaccine
Metcalf B. J.	2016	Strain features and distributions in pneumococci from children with invasive disease before and after 13-valent conjugate vaccine implementation in the USA
Metcalf C. J.	2011	Modelling the first dose of measles vaccination: the role of maternal immunity, demographic factors, and delivery systems
Miller E.	2001	Planning, registration, and implementation of an immunisation campaign against meningococcal serogroup C disease in the UK: a success story
Moffitt K. L.	2012	Broad antibody and T cell reactivity induced by a pneumococcal whole-cell vaccine
Moore M. R.	2008	Population snapshot of emergent Streptococcus pneumoniae serotype 19A in the United States, 2005
Mueller J. E.	2009	Environmental poliovirus surveillance during oral poliovirus vaccine and inactivated poliovirus vaccine use in Córdoba Province, Argentina
Munabi-Babigumira S.	2017	Factors that influence the provision of intrapartum and postnatal care by skilled birth attendants in low- and middle-income countries: a qualitative evidence synthesis
Nagy L.	2016	The Clinical Impact and Cost Effectiveness of Quadrivalent Versus Trivalent Influenza Vaccination in Finland
Nair M.	2012	Protein conjugate polysaccharide vaccines: challenges in development and global implementation
Nair N.	2007	Age-dependent differences in IgG isotype and avidity induced by measles vaccine received during the first year of life
Navarro Torné A.	2014	European enhanced surveillance of invasive pneumococcal disease in 2010: data from 26 European countries in the post-heptavalent conjugate vaccine era

First Author	Year Published	Title
Ng S. S.	2018	Systematic review of cost-effectiveness studies of human papillomavirus (HPV) vaccination: 9-Valent vaccine, gender-neutral and multiple age cohort vaccination
Nieto Guevara J.	2020	Interchangeability between pneumococcal conjugate vaccines for pediatric use: a systematic literature review
Nogier C.	2015	Can a Compact Pre-Filled Auto-Disable Injection System (cPAD) Save Costs for DTP-HepB-Hib Vaccine as Compared with Single-Dose (SDV) and Multi-Dose Vials (MDV)? Evidence from Cambodia, Ghana, and Peru
Nokes D. J.	1990	Measles immunization strategies for countries with high transmission rates: Interim guidelines predicted using a mathematical model
Nourbakhsh S.	2021	Effectiveness and cost-effectiveness of RSV infant and maternal immunization programs: A case study of Nunavik, Canada
O'Connor D.	2017	High-dimensional assessment of B-cell responses to quadrivalent meningococcal conjugate and plain polysaccharide vaccine
Olarte L.	2017	Emergence of Multidrug-Resistant Pneumococcal Serotype 35B among Children in the United States
Olivera I.	2020	Valuing the cost of improving Chilean primary vaccination: a cost minimization analysis of a hexavalent vaccine
Ozawa D.	2015	Impact of the Seven-valent Pneumococcal Conjugate Vaccine on Acute Otitis Media in Japanese Children: Emergence of Serotype 15A Multidrug-resistant Streptococcus pneumoniae in Middle Ear Fluid Isolates
Pai R.	2005	Postvaccine genetic structure of Streptococcus pneumoniae serotype 19A from children in the United States
Park J. B.	2008	Hepatitis B virus vaccine switch program for prevention of de novo hepatitis B virus infection in pediatric patients
Pascale J. M.	2021	Burden of Seasonal Influenza A and B in Panama from 2011 to 2017: An Observational Retrospective Database Study
Patel C.	2018	The impact of 10 years of human papillomavirus (HPV) vaccination in Australia: What additional disease burden will a nonavalent vaccine prevent?
Pavlovic M.	2010	Clinical and molecular evidence for association of SLE with parvovirus B19
Peckeu L.	2021	Impact and effectiveness of the 10-valent pneumococcal conjugate vaccine on invasive pneumococcal disease among children under 5 years of age in the Netherlands
Perdrizet J.	2021	Cost-effectiveness analysis of replacing the 10-valent pneumococcal conjugate vaccine (PCV10) with the 13-valent pneumococcal conjugate vaccine (PCV13) in Brazil infants
Perdrizet J.	2021	Cost-Effectiveness of the 13-Valent Pneumococcal Conjugate Vaccine (PCV13) Versus Lower-Valent Alternatives in Filipino Infants
Perez Chacon G.	2021	Whole-cell pertussis vaccine in early infancy for the prevention of allergy in children

First Author	Year Published	Title
Perkins T.	2017	Smith-Magenis Syndrome Patients Often Display Antibody Deficiency but Not Other Immune Pathologies
Phillips C. B.	2006	The switch to new conjugated vaccines may compromise immunisation coverage for refugees
Picazo J.	2017	Effect of the different 13-valent pneumococcal conjugate vaccination uptakes on the invasive pneumococcal disease in children: Analysis of a hospital-based and population-based surveillance study in Madrid, Spain, 2007-2015
Picazo J.	2013	Expansion of serotype coverage in the universal pediatric vaccination calendar: short-term effects on age- and serotype-dependent incidence of invasive pneumococcal clinical presentations in Madrid, Spain
Picazo J.	2013	Impact of introduction of conjugate vaccines in the vaccination schedule on the incidence of pediatric invasive pneumococcal disease requiring hospitalization in Madrid 2007 to 2011
Pichon B.	2013	Changes in molecular epidemiology of streptococcus pneumoniae causing meningitis following introduction of pneumococcal conjugate vaccination in England and Wales
Plotkin S.	2015	The history of vaccination against cytomegalovirus
Pollard A. J.	1999	Humoral immune responses to Neisseria meningitidis in children
Poore P.	1992	Availability of quality vaccines: policies of a non-government organization
Portnoy A.	2021	Impact and cost-effectiveness of strategies to accelerate cervical cancer elimination: A model-based analysis
Procaccianti M.	2020	First Case of Typhoid Fever due to Extensively Drug-resistant Salmonella enterica serovar Typhi in Italy
Pugh S.	2020	Estimating the Impact of Switching from a Lower to Higher Valent Pneumococcal Conjugate Vaccine in Colombia, Finland, and The Netherlands: A Cost-Effectiveness Analysis
Qiu J.	2017	Immunogenicity and safety evaluation of bivalent types 1 and 3 oral poliovirus vaccine by comparing different poliomyelitis vaccination schedules in China: A randomized controlled non-inferiority clinical trial
Radke S.	2017	Age-specific effectiveness following each dose of acellular pertussis vaccine among infants and children in New Zealand
Raes M.	2016	Epidemiological trends for hospital admissions for acute rotavirus gastroenteritis in Belgium following the introduction of routine rotavirus vaccination and the subsequent switch from lyophilized to liquid formulation of rotarix™
Rivera-Olivero I. A.	2009	Multiplex PCR reveals a high rate of nasopharyngeal pneumococcal 7-valent conjugate vaccine serotypes co-colonizing indigenous Warao children in Venezuela
Rodríguez A. C.	2017	Cervical cancer prevention in upper middle-income countries

First Author	Year Published	Title
Ruiz García Y.	2021	CIRCULATING CLONAL COMPLEXES AND SEQUENCE TYPES OF STREPTOCOCCUS PNEUMONIAE SEROTYPE 19A WORLDWIDE: THE IMPORTANCE OF MULTIDRUG RESISTANCE: A SYSTEMATIC LITERATURE REVIEW
Ruiz-Palacios G. M.	2020	Public health and economic impact of switching from a trivalent to a quadrivalent inactivated influenza vaccine in Mexico
Ryan G.	2022	Challenges to Adolescent HPV Vaccination and Implementation of Evidence-Based Interventions to Promote Vaccine Uptake During the COVID-19 Pandemic: "HPV Is Probably Not at the Top of Our List"
Sáez-Llorens X.	2016	Immunogenicity and safety of a novel monovalent high-dose inactivated poliovirus type 2 vaccine in infants: A comparative, observer-blind, randomised, controlled trial
Sandmann F.	2021	Evaluating the impact of a continued maternal pertussis immunisation programme in England: A modelling study and cost-effectiveness analysis
Sangrujee N.	2004	Cost analysis of post-polio certification immunization policies
Scheifele D. W.	2003	Immunization Monitoring Program, Active: a model of active surveillance of vaccine safety
Schmidt-Ott R.	2020	Assessing direct and indirect effects of pediatric influenza vaccination in Germany by individual-based simulations
Schonberger L. B.	1976	Vaccine-associated poliomyelitis in the United States, 1961-1972
Scott A.	2011	The effect of financial incentives on the quality of health care provided by primary care physicians
Sealey K. L.	2015	Genomic analysis of isolates from the United Kingdom 2012 pertussis outbreak reveals that vaccine antigen genes are unusually fast evolving
Setchanova L. P.	2015	Dominance of multidrug-resistant Denmark(14)-32 (ST230) clone among Streptococcus pneumoniae serotype 19A isolates causing pneumococcal disease in Bulgaria from 1992 to 2013
Shaghaghi M.	2019	Vaccine-Derived Poliovirus Infection among Patients with Primary Immunodeficiency and Effect of Patient Screening on Disease Outcomes, Iran
Shah I.	2008	Acute demyelinating encephalomyelitis due to neural antirabies vaccine
Sheppard C. L.	2019	The Genomics of Streptococcus Pneumoniae Carriage Isolates from UK Children and Their Household Contacts, Pre-PCV7 to Post-PCV13
Shibl A. M.	2012	Antibiotic resistance and serotype distribution of invasive pneumococcal diseases before and after introduction of pneumococcal conjugate vaccine in the Kingdom of Saudi Arabia (KSA)
Shuel M.	2011	Invasive Haemophilus influenzae in British Columbia: non-Hib and non-typeable strains causing disease in children and adults

First Author	Year Published	Title
Shukla G. S.	2017	Vaccine-draining lymph nodes of cancer patients for generating anti-cancer antibodies
Silveira M. M.	2021	Surveillance of invasive meningococcal disease in the south of Brazil: considerations of immunization programme
Sime W. T.	2016	The impact of ten-valent pneumococcal conjugate vaccine (pcv10) on streptococcus pneumoniae nasopharyngeal carriage rate: Phenotypic and genetic diversity of isolates from vaccinated children in addis ababa, Ethiopia
Simões A. S.	2011	Clonal evolution leading to maintenance of antibiotic resistance rates among colonizing Pneumococci in the PCV7 era in Portugal
Singanayagam A.	2018	Urgent challenges in implementing live attenuated influenza vaccine
Singh M.	2018	Inequality in the immunization schedules of different states of the same country: Are we aware?
Singleton R.	2000	Experience with the prevention of invasive Haemophilus influenzae type b disease by vaccination in Alaska: the impact of persistent oropharyngeal carriage
Siu T.	2008	Impact of routine immunization using meningococcal C conjugate vaccine on invasive meningococcal disease in British Columbia
Sizaire V.	2014	Increase of pertussis incidence in 2010 to 2012 after 12 years of low circulation in Spain
Small T. N.	2011	Safety and immunogenicity of the 13-valent protein-conjugated pneumococcal vaccine(PCV13) following related and unrelated hematopoietic stem cell transplantation (HCT)
Soto J. A.	2018	Recombinant BCG Vaccines Reduce Pneumovirus-Caused Airway Pathology by Inducing Protective Humoral Immunity
Sparrow E.	2021	Global production capacity of seasonal and pandemic influenza vaccines in 2019
Stanford J. L.	1991	Improving on BCG
Steens A.	2015	Decreased Carriage and Genetic Shifts in the Streptococcus pneumoniae Population After Changing the Seven-valent to the Thirteen-valent Pneumococcal Vaccine in Norway
Stoecker C.	2013	Cost-effectiveness of using 2 vs 3 primary doses of 13-valent pneumococcal conjugate vaccine
Suwantika A. A.	2020	Impact of switch options on the economics of pneumococcal conjugate vaccine (PCV) introduction in Indonesia
Tagbo B. N.	2020	Randomized Controlled Clinical Trial of bivalent Oral Poliovirus Vaccine and Inactivated Poliovirus Vaccine in Nigerian Children
Taha M. K.	2020	Recent changes of invasive meningococcal disease in France: arguments to revise the vaccination strategy in view of those of other countries

First Author	Year Published	Title
Taniuchi M.	2017	Community transmission of type 2 poliovirus after cessation of trivalent oral polio vaccine in Bangladesh: an open-label cluster-randomised trial and modelling study
Teljeur C.	2018	Economic Evaluation of Selective Neonatal Bacillus Calmette-Guérin Vaccination of High-risk Infants in Ireland
Temime L.	2008	Impact of capsular switch on invasive pneumococcal disease incidence in a vaccinated population
Thanawastien A.	2015	Conjugate-like immunogens produced as protein capsular matrix vaccines
Thommes E. W.	2015	Cost-effectiveness evaluation of quadrivalent influenza vaccines for seasonal influenza prevention: A dynamic modeling study of Canada and the United Kingdom
Thommes E. W.	2014	Examining Ontario's universal influenza immunization program with a multi-strain dynamic model
Thommes E. W.	2017	Review of seasonal influenza in Canada: Burden of disease and the cost-effectiveness of quadrivalent inactivated influenza vaccines
Thompson K. M.	2008	The risks, costs, and benefits of possible future global policies for managing polioviruses
Thompson K. M.	2012	Trends in the risk of U.S. polio outbreaks and poliovirus vaccine availability for response
Tin Tin Htar M.	2020	Advance system testing: Vaccine benefit studies using multi-country electronic health data - The example of pertussis vaccination
Toapanta F. R.	2016	Oral Challenge with Wild-Type Salmonella Typhi Induces Distinct Changes in B Cell Subsets in Individuals Who Develop Typhoid Disease
Toltzis P.	2005	The epidemiology of childhood pneumococcal disease in the United States in the era of conjugate vaccine use
Tong H. H.	2000	Evaluation of phase variation of nontypeable Haemophilus influenzae lipooligosaccharide during nasopharyngeal colonization and development of otitis media in the chinchilla model
Tramper-Stranders G. A.	2018	Childhood community-acquired pneumonia: A review of etiology- and antimicrobial treatment studies
Tsang R. S. W.	2021	A Narrative Review of the Molecular Epidemiology and Laboratory Surveillance of Vaccine Preventable Bacterial Meningitis Agents: Streptococcus pneumoniae, Neisseria meningitidis, Haemophilus influenzae and Streptococcus agalactiae
Tsilifis C.	2020	BCG lymphadenitis: A potential complication of immune reconstitution following haematopoietic stem cell transplant
Tucker A. W.	2001	Cost-effectiveness analysis of changing from live oral poliovirus vaccine to inactivated poliovirus vaccine in Australia

First Author	Year Published	Title
Urueña A.	2021	Cost-effectiveness analysis of switching from trivalent to quadrivalent seasonal influenza vaccine in Argentina
Valdin H. L.	2017	Influenza vaccines effectiveness 2013-14 through 2015-16, a test-negative study in children
Valente C.	2012	Decrease in pneumococcal co-colonization following vaccination with the seven-valent pneumococcal conjugate vaccine
Van de Poel E.	2016	Impact of Performance-Based Financing in a Low-Resource Setting: A Decade of Experience in Cambodia
Van De Velde N.	2012	Population-level impact of the bivalent, quadrivalent, and nonavalent human papillomavirus vaccines: A model-based analysis
van der Linden M.	2015	Effects of Infant Pneumococcal Conjugate Vaccination on Serotype Distribution in Invasive Pneumococcal Disease among Children and Adults in Germany
van Tonder A. J.	2015	Genomics Reveals the Worldwide Distribution of Multidrug-Resistant Serotype 6E Pneumococci
Varghese J.	2020	Multistate population and whole genome sequence-based strain surveillance of invasive pneumococci recovered in the USA during 2017
Varghese T.	2022	Understanding Rotavirus Vaccine Efficacy and Effectiveness in Countries with High Child Mortality
Vashishtha V. M.	2008	Recommendations of 2nd national consultative meeting of Indian Academy of Pediatrics (IAP) on polio eradication and improvement of routine immunization
Vestjens S. M. T.	2019	Twelve years of pneumococcal conjugate vaccination in the Netherlands: Impact on incidence and clinical outcomes of invasive pneumococcal disease
Vissers M.	2018	Increased carriage of non-vaccine serotypes with low invasive disease potential four years after switching to the 10-valent pneumococcal conjugate vaccine in The Netherlands
Voorman A.	2022	Analysis of population immunity to poliovirus following cessation of trivalent oral polio vaccine
Walter E. B.	2022	Prevention of pneumococcal infections in childhood: Two decades of progress
Wang L.	2016	Immunogenicity and safety of an inactivated quadrivalent influenza vaccine in US children 6-35 months of age during 2013-2014: Results from a phase II randomized trial
Wang X.	2015	Changes in the Population Structure of Invasive Neisseria meningitidis in the United States After Quadrivalent Meningococcal Conjugate Vaccine Licensure
Wasserman M.	2018	Dynamic transmission modelling to address infant pneumococcal conjugate vaccine schedule modifications in the UK
Wasserman M.	2019	Modeling the sustained use of the 13-valent pneumococcal conjugate vaccine compared to switching to the 10-valent vaccine in Mexico

First Author	Year Published	Title
Wedlock P. T.	2021	Should countries switch to using five- or ten-dose rotavirus vaccines now that they are available?
WHO Rabies Modelling Consortium	2019	The potential effect of improved provision of rabies post-exposure prophylaxis in Gavi-eligible countries: a modelling study
Wijesinghe P. R.	2016	Immunogenicity of live attenuated Japanese encephalitis SA 14-14-2 vaccine among Sri Lankan children with previous receipt of inactivated JE vaccine
Wilder-Smith A.	2002	Crossover vaccination with quadrivalent meningococcal vaccine (against A/C/Y/W-135) following recent application of bivalent meningococcal vaccine (against A/C): assessment of safety and side effect profile
Williams B. G.	1995	Measles vaccination policy
Wilson M. R.	2018	Response to McGirr et al.'s Comment on “Clinical and Economic Impact of a Potential Switch from 13-Valent to 10-Valent Pneumococcal Conjugate Infant Vaccination in Canada”
Wilson M. R.	2021	Validation of a Novel Forecasting Method for Estimating the Impact of Switching Pneumococcal Conjugate Programs: Evidence from Belgium
Wilson M.	2018	Clinical and Economic Impact of a Potential Switch from 13-Valent to 10-Valent Pneumococcal Conjugate Infant Vaccination in Canada
Wnukowski-Mtonga P.	2020	Scientific evidence supporting recommendations on the use of the 9-valent HPV vaccine in a 2-dose vaccine schedule in Australia
World Health O.	2017	Polio vaccines: WHO position paper, March 2016-recommendations
Wouters I.	2019	Follow-up of serotype distribution and antimicrobial susceptibility of Streptococcus pneumoniae in child carriage after a PCV13-to-PCV10 vaccine switch in Belgium
Wouters I.	2020	How nasopharyngeal pneumococcal carriage evolved during and after a PCV13-to-PCV10 vaccination programme switch in Belgium, 2016 to 2018
Wouters I.	2018	Nasopharyngeal s. pneumoniae carriage and density in Belgian infants after 9 years of pneumococcal conjugate vaccine programme
Wu D. B. C.	2015	Choosing between 7-, 10- and 13-valent pneumococcal conjugate vaccines in childhood: A review of economic evaluations (2006-2014)
Wu Y.	2014	Antitoxins for diphtheria and tetanus decline more slowly after vaccination with DTwP than with DTaP: A study in a Chinese population
Xu J.	2021	Immunogenicity of sequential poliovirus vaccination schedules with different strains of poliomyelitis vaccines in Chongqing, China: a cross-sectional survey
Xu J.	2020	Sero-survey of polio antibodies and quality of acute flaccid paralysis surveillance in Chongqing, China: A cross-sectional study

First Author	Year Published	Title
Yan D.	2021	Implication of a High Risk for Type 2 Vaccine-Derived Poliovirus Emergence and Transmission after the Switch from Trivalent to Bivalent Oral Poliovirus Vaccine
Yang R.	2005	B lymphocyte activation by human papillomavirus-like particles directly induces Ig class switch recombination via TLR4-MyD88
Yang W.	2014	The budget impact of controlling wastage with smaller vials: A data driven model of session sizes in Bangladesh, India (Uttar Pradesh),Mozambique, and Uganda
Yi D. Y.	2016	Changes of hepatitis B virus antibody titer by children's age and effectiveness of booster vaccination in endemic area
Yuan B.	2017	Payment methods for outpatient care facilities
Yun K. W.	2018	Genetic structures of invasive Streptococcus pneumoniae isolates from Korean children obtained between 1995 and 2013
Zeddeman A.	2014	Investigations into the emergence of pertactin-deficient Bordetella pertussis isolates in six European countries, 1996 to 2012
Zhang L.	2014	Acellular vaccines for preventing whooping cough in children
Zhao H.	2021	Circulation of Type 2 Vaccine-Derived Poliovirus in China in 2018-2019
Zhao T.	2021	Reduced mucosal immunity to poliovirus after cessation of trivalent oral polio vaccine
Zurbriggen S.	2008	Isolation of Sabin-like polioviruses from wastewater in a country using inactivated polio vaccine
Not vaccines of interest		
Brinkman D. M. C.	2003	Vaccination with Rabies to Study the Humoral and Cellular Immune Response to a T-Cell Dependent Neoantigen in Man
Bokharaie V. S.	2021	A study on the effects of containment policies and vaccination on the spread of SARS-CoV-2
Changalucha J.	2019	The need to improve access to rabies post-exposure vaccines: Lessons from Tanzania
He T.	2016	Chronic HBV: which pregnant women should be treated?
Kasting M. L.	2020	Public perceptions of the effectiveness of recommended non-pharmaceutical intervention behaviors to mitigate the spread of SARS-CoV-2
Rincon-Arevalo H.	2021	Impaired humoral immunity to SARS-CoV-2 BNT162b2 vaccine in kidney transplant recipients and dialysis patients
Unknown author	2018	Crisis-driven cholera resurgence switches focus to oral vaccine

Appendix S4 Quality assessment of narrative review articles using a scale for a quality assessment of narrative review articles (SANRA)

SANRA, a scale for a quality assessment of narrative review articles	Bahl, 2017	Califano, 2016	Fahmy, 2017	Gamage, 2018	Garg, 2018	Garon, 2016	Garon, 2017	Gurung, 2017	Hampton, 2016	Hampton, 2017	Horn, 2021
Justification of the articles importance for readership	2	1	2	2	2	2	2	2	2	2	2
Statement of concrete aims or formulation of questions	2	2	2	1	2	1	1	1	1	2	2
Description of the literature search	0	2	0	0	0	0	0	0	0	0	0
Referencing	2	2	2	2	2	2	2	2	1	2	2
Scientific Reasoning	2	1	2	1	2	2	2	2	2	2	2
Appropriate presentation of data	2	2	2	2	2	2	2	2	2	2	2
Sum	10	10	10	8	10	9	9	9	8	10	10

Appendix S4 Quality assessment of narrative review articles using a scale for a quality assessment of narrative review articles (SANRA) (continued)

SANRA, a scale for a quality assessment of narrative review articles	Icardi, 2018	Jog, 2016	John, 2013	Menning, 2017	Nafi, 2019	Orenstein, 2015	Pedreira, 2017	Pervaiz, 2017	Ramirez Gonzalez, 2017	Snelling, 2015	Tevi-Benissan, 2017	Thacker, 2016
Justification of the articles importance for readership	1	2	2	2	2	2	2	2	2	1	2	2
Statement of concrete aims or formulation of questions	0	1	2	2	1	2	2	2	2	1	2	1
Description of the literature search	0	0	0	0	0	0	0	0	0	0	0	0
Referencing	2	1	2	2	2	2	2	1	2	2	2	2
Scientific Reasoning	1	1	2	2	1	2	2	2	2	2	2	1
Appropriate presentation of data	2	2	2	2	2	2	2	2	2	2	2	1
Sum	6	7	10	10	8	10	10	9	10	8	10	7

Appendix S4 Quality assessment of narrative review articles using a scale for a quality assessment of narrative review articles (SANRA) (continued)

SANRA, a scale for a quality assessment of narrative review articles	Fine, 1999	Pan American Health Organization, 2017
Justification of the articles importance for readership	2	2
Statement of concrete aims or formulation of questions	2	2
Description of the literature search	0	0
Referencing	2	2
Scientific Reasoning	2	2
Appropriate presentation of data	2	2
Sum	10	10

Table S5 Quality assessment of survey study using A Consensus-Based Checklist for Reporting of Survey Studies (CROSS)

A Consensus-Based Checklist for Reporting of Survey Studies (CROSS)	Freed, 2006	Usuf, 2014	Kaucley, 2020
Title and abstract			
State the word "survey" along with a commonly used term in title or abstract to introduce the study's design.	Yes	Yes	Yes
Provide an informative summary in the abstract, covering background, objectives, methods, findings/results, interpretation/discussion, and conclusions.	Yes	Yes	Yes
Introduction			
Provide a background about the rationale of study, what has been previously done, and why this survey is needed	Yes	Yes	Yes
Identify specific purposes, aims, goals, or objectives of the study.	Yes	Yes	Yes
Methods			
Specify the study design in the methods section with a commonly used term (e.g., cross-sectional or longitudinal).	Unclear	Yes	Yes
Describe the questionnaire (e.g., number of sections, number of questions, number and names of instruments used).	Unclear	Yes	No
Describe all questionnaire instruments that were used in the survey to measure particular concepts. Report target population, reported validity and reliability information, scoring/classification procedure, and reference links (if any).	Yes	Yes	No
Provide information on pretesting of the questionnaire, if performed (in the article or in an online supplement). Report the method of pretesting, number of times questionnaire was pre-tested, number and demographics of participants used for pretesting, and the level of similarity of demographics between pre-testing participants and sample population.	Unclear	Yes	No
Questionnaire if possible, should be fully provided (in the article, or as appendices or as an online supplement).	No	No	No
Describe the study population (i.e., background, locations, eligibility criteria for participant inclusion in survey, exclusion criteria).	Yes	Yes	Yes
Describe the sampling techniques used (e.g., single stage or multistage sampling, simple random sampling, stratified sampling, cluster sampling, convenience sampling). Specify the locations of sample participants whenever clustered sampling was applied	Yes	No	Unclear
Provide information on sample size, along with details of sample size calculation.	Yes	No	Unclear
Describe how representative the sample is of the study population (or target population if possible), particularly for population-based surveys.	No	Yes	Yes

A Consensus-Based Checklist for Reporting of Survey Studies (CROSS)	Freed, 2006	Usuf, 2014	Kaucley, 2020
Provide information on modes of questionnaire administration, including the type and number of contacts, the location where the survey was conducted (e.g., outpatient room or by use of online tools, such as SurveyMonkey).	Yes	Yes	Yes
Provide information of survey's time frame, such as periods of recruitment, exposure, and follow-up days.	Yes	Unclear	Yes
–>For non-web-based surveys, provide approaches to minimize human error in data entry. –>For web-based surveys, provide approaches to prevent "multiple participation" of participants.	No	No	No
Describe any preparation process before conducting the survey (e.g., interviewers' training process, advertising the survey).	Yes	Yes	No
Provide information on ethical approval for the survey if obtained, including informed consent, institutional review board [IRB] approval, Helsinki declaration, and good clinical practice [GCP] declaration (as appropriate).	No	No	Yes
Provide information about survey anonymity and confidentiality and describe what mechanisms were used to protect unauthorized access.	No	No	No
Describe statistical methods and analytical approach. Report the statistical software that was used for data analysis.	Yes	Yes	Yes
Report any modification of variables used in the analysis, along with reference (if available).	No	No	No
Report details about how missing data was handled. Include rate of missing items, missing data mechanism (i.e., missing completely at random [MCAR], missing at random [MAR] or missing not at random [MNAR]) and methods used to deal with missing data (e.g., multiple imputation).	No	No	No
State how non-response error was addressed.	No	No	No
For longitudinal surveys, state how loss to follow-up was addressed.	NA	NA	NA
Indicate whether any methods such as weighting of items or propensity scores have been used to adjust for non-representativeness of the sample	No	No	No
Describe any sensitivity analysis conducted.	No	No	No
Results			
Report numbers of individuals at each stage of the study. Consider using a flow diagram, if possible	Unclear	Yes	Yes
Provide reasons for non-participation at each stage, if possible.	Yes	No	No

A Consensus-Based Checklist for Reporting of Survey Studies (CROSS)	Freed, 2006	Usuf, 2014	Kaucley, 2020
Report response rate, present the definition of response rate or the formula used to calculate response rate.	Yes	No	No
Provide information to define how unique visitors are determined. Report number of unique visitors along with relevant proportions (e.g., view proportion, participation proportion, completion proportion).	No	No	Yes
Provide characteristics of study participants, as well as information on potential confounders and assessed outcomes.	Unclear	Unclear	Unclear
Give unadjusted estimates and, if applicable, confounder-adjusted estimates along with 95% confidence intervals and p-values.	Yes	No	No
For multivariable analysis, provide information on the model building process, model fit statistics, and model assumptions (as appropriate).	NA	NA	NA
Provide details about any sensitivity analysis performed. If there are considerable amount of missing data, report sensitivity analyses comparing the results of complete cases with that of the imputed dataset (if possible).	NA	NA	NA
Discussion			
Discuss the limitations of the study, considering sources of potential biases and imprecisions, such as non-representativeness of sample, study design, important uncontrolled confounders.	No	Yes	Yes
Give a cautious overall interpretation of results, based on potential biases and imprecisions and suggest areas for future research.	Yes	Yes	Yes
Discuss the external validity of the results.	Unclear	Yes	Yes
Other			
State whether any funding organization has had any roles in the survey's design, implementation, and analysis.	No	Yes	Yes
Declare any potential conflict of interest.	Yes	Yes	Yes
Provide names of organizations/persons that are acknowledged along with their contribution to the research.	NA	Yes	Yes

Appendix S6 Quality assessment of observational studies using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist

STROBE checklist for observational studies	Kolasa, 2001	Soeters, 2019	Suarez, 2016	Wahjuhono, 2014
Title and abstract				

STROBE checklist for observational studies	Kolasa, 2001	Soeters, 2019	Suarez, 2016	Wahjuhono, 2014
(a) Indicate the study's design with a commonly used term in the title or the abstract	No	No	Yes	No
(b) Provide in the abstract an informative and balanced summary of what was done and what was found	Yes	Yes	Yes	Unclear
Introduction				
Explain the scientific background and rationale for the investigation being reported	Yes	Yes	Yes	Yes
State specific objectives, including any prespecified hypotheses	Yes	Yes	Yes	Yes
Methods				
Present key elements of study design early in the paper	Yes	Yes	Yes	Yes
Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Yes	Yes	Yes	Yes
(a) Cohort study—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up Case-control study—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants	Yes	Yes	Unclear	Yes
(b) Cohort study—For matched studies, give matching criteria and number of exposed and unexposed Case-control study—For matched studies, give matching criteria and the number of controls per case	NA	NA	NA	NA
Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Unclear	Unclear	Yes	Yes
For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Yes	Yes	Yes	Yes

STROBE checklist for observational studies	Kolasa, 2001	Soeters, 2019	Suarez, 2016	Wahjuhono, 2014
Describe any efforts to address potential sources of bias	No	No	No	No
Explain how the study size was arrived at	Yes	No	No	No
Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Unclear	No	Yes	Yes
(a) Describe all statistical methods, including those used to control for confounding	Unclear	Yes	Yes	No
(b) Describe any methods used to examine subgroups and interactions	Unclear	Yes	Yes	No
(c) Explain how missing data were addressed	No	Yes	No	No
(d) Cohort study—If applicable, explain how loss to follow-up was addressed;Case-control study—If applicable, explain how matching of cases and controls was addressed; Cross-sectional study—If applicable, describe analytical methods taking account of sampling strategy	Yes	NA	NA	Yes
(e) Describe any sensitivity analyses	NA	Yes	Yes	No
Results				
(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Yes	Yes	NA	Yes
b) Give reasons for non-participation at each stage	Unclear	Yes	NA	Unclear
c) Consider use of a flow diagram	No	No	No	No
a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	No	Unclear	Unclear	Unclear
(b) Indicate number of participants with missing data for each variable of interest	Yes	Yes	NA?	No
(c) Cohort study—Summarise follow-up time (eg, average and total amount)	Yes	Yes	NA	Yes
Cohort study—Report numbers of outcome events or summary measures over time; Case-control study—Report numbers in each exposure category, or summary measures of exposure; Cross-sectional study—Report numbers of outcome events or summary measures	Yes	Yes	Yes	Yes
(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders	Unclear	Yes	Yes	Unclear

STROBE checklist for observational studies	Kolasa, 2001	Soeters, 2019	Suarez, 2016	Wahjuhono, 2014
were adjusted for and why they were included				
(b) Report category boundaries when continuous variables were categorized	NA	NA	NA	NA
(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA	Yes	NA	NA
Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA	Yes	Yes	NA
Discussion				
Summarise key results with reference to study objectives	Yes	Yes	Yes	Yes
Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Unclear	Yes	Yes	Unclear
Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Yes	Yes	Yes	Yes
Discuss the generalisability (external validity) of the study results	Yes	Yes	Yes	Yes
Other				
Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	No	Unclear	Unclear	Unclear

Appendix S7 Quality assessment of observational studies using Risk Of Bias In Non-randomized Studies - of Exposure (ROBINS-E)

	Kolasa, 2001	Wahjuhono, 2014	Suarez, 2016	Soeters, 2019
Bias due to confounding	High	Low	Low	Low
Bias arising from measurement of the exposure	Low	Low	Low	Low
Bias in selection of participants into the study	Some concerns	Low	Low	Low
Bias due to post-exposure interventions	Low	Low	Low	Low
Bias due to missing data	Some concerns	Some concerns	High	Low
Bias arising from measurement of outcomes	Low	Low	Low	Low
Bias in selection of the reported result	High	Low	Low	Low
Overall risk-of-bias rating	High	Some concerns	High	Low