**Appendix 1: Search query and strategy**

**Search Query:** Keyword and free text (title and abstract) terms relating to 'vaccines' or 'immunization' AND 'policy' or 'policy making' AND 'introduction' or 'adoption'

March 2010 to August 2020

**Search Strategy:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Database** | **Strategy** | **Run Date** | **Records** |
| **Medline**  **(OVID)**  **1946-** | \*Vaccines/OR \*Vaccination/OR \*Immunization Programs/OR (vaccine\* OR vaccination\* OR immunization\* OR immunisation\*).ti,ab.  AND  Policy Making/OR Health Policy/OR Decision Making, Organizational/ OR (policy OR policies OR decision-making OR planning).ti,ab.  AND  Health Plan Implementation/OR (Adopt\* OR introduc\* OR implement\* OR priorit\* OR new program\*).ti,ab.  Limit 2010 - | 08/18/2020 | 2,534 |
| **Embase**  **(OVID)**  **1947-** | (\*Vaccines/OR \*Vaccination/OR Mass Immunization/) AND \*Preventive Health Service/) OR (vaccine\* OR vaccination\* OR immunization\* OR immunisation\*).ti,ab.  AND  Health Care Policy/OR Decision Making/OR (policy OR policies OR decision\* OR planning).ti,ab.  AND  Health Care Planning/OR (Adopt\* OR introduc\* OR implement\* OR priorit\* OR new program\*).ti,ab.  Limit 2010 -  Exclude Medline journals | 08/18/2020 | 367  -76 Duplicates Removed  =291 Records Kept |
| **Global Health (OVID)**  **1982-** | (vaccine\* OR vaccination\* OR immunization\* OR immunisation\*).ti,ab,sh.  AND  (policy OR policies OR decision\* OR planning).ti,ab,sh.  AND  (Adopt\* OR introduc\* OR implement\* OR priorit\* OR new program\*).ti,ab,sh.  Limit 2010- | 08/18/2020 | 2345  -1531 Duplicates Removed  =814 Records Kept |
| **Cochrane**  **Library** | [mh Vaccines] OR [mh Vaccination] OR [mh "Immunization Programs"] OR (vaccine\* OR vaccination\* OR immunization\* OR immunisation\*):ti,ab  AND  [mh "Policy Making"] OR [mh "Health Policy"] OR [mh "Decision Making, Organizational"] OR (policy OR policies OR decision-making OR planning):ti,ab  AND  [mh "Health Plan Implementation"] OR (Adopt\* OR introduc\* OR implement\* OR priorit\* OR new program\*):ti,ab  Limit 2010- | 08/18/2020 | 100  -46 Duplicates Removed  =54 Records Kept |
| **CINAHL** | (MH Vaccines) OR (MH Vaccination) OR (MH "Immunization Programs") OR (TI (vaccine\* OR vaccination\* OR immunization\* OR immunisation\*)) OR (AB (vaccine\* OR vaccination\* OR immunization\* OR immunisation\*))  AND  (MH "Policy Making") OR (MH "Health Policy") OR (MH "Decision Making, Organizational") OR (TI (policy OR policies OR decision-making OR planning)) OR (AB (policy OR policies OR decision-making OR planning))  AND  (MH "Health Plan Implementation") OR (TI (Adopt\* OR introduc\* OR implement OR priorit\* OR "new program\*")) OR (AB (Adopt\* OR introduc\* OR implement\* OR priorit\* OR "new program\*"))  Limit 2010 -  Exclude Medline Records | 08/18/2020 | 225  -154 Duplicates Removed  =71 Records Kept |
| **Scopus** | TITLE (National decision-making on adopting new vaccines) citing reference search | 08/18/2020 | 50  -6 Duplicates Removed  =44 Records Kept |

**Appendix 2: Definitions for classifying selected articles based on type of article**

We defined the types of articles included in the review as follows.

* Type 1 – Frameworks of vaccine introduction decision-making: Articles that defined a set of criteria, or types of evidence deemed necessary or relevant by a country to decide on vaccination policy. Hypothetical decision-making was included if the article presented a clear set of criteria as a basis for decision-making.
* Type 2 – Studies that collect or analyze empirical data on vaccine introduction decision-making: Any study that used qualitative or quantitative data collection methods to assess the policy process or the criteria valued by national immunization stakeholders for introducing new vaccines or reviewing immunization policy, including in emergency situations. Examples of vaccine introduction decision-making include articles which focus on the processes used for vaccine introduction decision-making or for reviewing vaccine schedules in a specific country, and those which focus on the use of evidence for public health decisions.
* Type 3 – Theoretical and empirical articles that provide insights into the vaccine policymaking process, including any article that provides insights into the vaccine policymaking process, especially the factors that enabled vaccine introduction.

**Appendix 3: Quality appraisal questions – Mixed Methods Appraisal Tool**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Types of mixed method study or their components** | **Methodological quality criteria** | **Response options** | | | **Comments** |
| **Yes** | **No** | **Cannot tell** |
| **Screening questions (ALL STUDY TYPES)** | Are there clear qualitative and quantitative research questions (or objectives\*), or a clear mixed methods question (or objective\*)? |  |  |  |  |
| Do collected data address the research question (objective)? E.g., consider whether the follow-up period is long enough for the  outcome to occur (for longitudinal studies or study components). |  |  |  |  |
| ***Further appraisal may not be feasible or appropriate when answer to one of these questions is No or Can’t tell*** | | | | |
| **1. Qualitative** | 1.1 Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question (objective)? |  |  |  |  |
| 1.2 Is the process for analyzing qualitative data relevant to address the research question (objective)? |  |  |  |  |
| 1.3 Is appropriate consideration given to how findings relate to the context, e.g., the setting, in which the data were collected? |  |  |  |  |
| 1.4 Is appropriate consideration given to how findings relate to researchers’ influence, e.g., through their interactions with participants? |  |  |  |  |
| **2. Quantitative (RCTs)** | 2.1 Is there a clear description of the randomization (or an appropriate sequence generation)? |  |  |  |  |
| 2.2 Is there a clear description of the allocation concealment (or blinding when applicable)? |  |  |  |  |
| 2.3 Are there complete outcome data (80% or above)? |  |  |  |  |
| 2.4 Is there low withdrawal/drop-out (below 20%)? |  |  |  |  |
| **3. Quantitative (non-RCTs)** | 3.1 Are participants (organizations) recruited in a way that minimizes selection bias? |  |  |  |  |
| 3.2 Are measurements appropriate (clear origin, or validity known, or standard instrument; and absence of contamination between groups when appropriate) regarding the exposure/intervention and outcomes? |  |  |  |  |
| 3.3 In the groups being compared (exposed vs. non-exposed; with intervention vs. without; cases vs. controls), are the participants comparable, or do researchers take into account (control for) the difference between these groups? |  |  |  |  |
| 3.4 Are there complete outcome data (80% or above), and, when applicable, an acceptable response rate (60% or above), or an acceptable follow-up rate for cohort studies (depending on the duration of follow-up)? |  |  |  |  |
| **4. Quantitative (descriptive)** | 4.1 Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed methods question)? |  |  |  |  |
| 4.2 Is the sample representative of the population understudy? |  |  |  |  |
| 4.3 Are measurements appropriate (clear origin, or validity known, or standard instrument)? |  |  |  |  |
| 4.4. Is there an acceptable response rate (60% or above)? |  |  |  |  |
| **5. Mixed methods** | 5.1 Is the mixed methods research design relevant to address the qualitative and quantitative research questions (or objectives), or the qualitative and quantitative aspects of the mixed methods question (or objective)? |  |  |  |  |
| 5.2 Is the integration of qualitative and quantitative data (or results\*) relevant to address the research question (objective)? |  |  |  |  |
| 5.3 Is appropriate consideration given to the limitations associated with this integration, e.g., the divergence of qualitative and quantitative data (or results\*) in a triangulation design? |  |  |  |  |
|  | ***Criteria for the qualitative component (1.1 to 1.4), and appropriate criteria for the quantitative component (2.1 to 2.4, or 3.1 to 3.4, or 4.1 to 4.4), must be also applied.*** | | | | |

\*These two items are not considered as double-barreled items since in mixed methods research, (1) there may be research questions (quantitative research) or research objectives (qualitative research), and (2) data may be integrated, and/or qualitative findings and quantitative results can be integrated.

**Appendix 4: Articles included in the systematic review of national decision-making, by type of article, 2010–2020**

* Type 1–Frameworks

|  |  |  |
| --- | --- | --- |
| **Framework** | **Country and country income level** | **Vaccine focus** |
| M. Ceyhan, "Recent improvements in the Turkish Childhood National Immunization Program," Turkish Journal of Pediatrics, vol. 52, no. 6, pp. 563-9, 2010. | Turkey–UMIC | None specifically |
| H. Houweling, C. F. Wittevrongel, M. Verweij, E. J. Ruitenberg, and N. National Immunisation Programme Review Committee of the Health Council of the, "Public vaccination programmes against hepatitis B in The Netherlands: assessing whether a targeted or a universal approach is appropriate," Vaccine, vol. 28, no. 49, pp. 7723-30, 2010. | The Netherlands–HIC | HBV |
| T. J. John, "India's National Technical Advisory Group on Immunisation," Vaccine, vol. 28 Suppl 1, pp. A88-90, 2010. | India–LMICGavi supported | None specifically |
| G. La Torre, C. de Waure, G. Chiaradia, A. Mannocci, S. Capri, and W. Ricciardi, "The Health Technology Assessment of bivalent HPV vaccine Cervarix in Italy," Vaccine, vol. 28, no. 19, pp. 3379-84, 2010. | Italy–HIC | HPV |
| O. S. Levine et al., "A policy framework for accelerating adoption of new vaccines," Human Vaccines, vol. 6, no. 12, pp. 1021-4, 2010. | LIC and LMIC, all Gavisupported countries | Hib |
| O. S. Levine, M. D. Knoll, A. Jones, D. G. Walker, N. Risko, and Z. Gilani, "Global status of Haemophilus influenzae type b and pneumococcal conjugate vaccines: evidence, policies, and introductions," Current Opinion in Infectious Diseases, vol. 23, no. 3, pp. 236-41, 2010. | Global–Gavi and non-Gavi supported countries | Hib |
| F. Ahmed, J. L. Temte, D. Campos-Outcalt, H. J. Schunemann, and A. E. B. R. W. Group, "Methods for developing evidence-based recommendations by the Advisory Committee on Immunization Practices (ACIP) of the U.S. Centers for Disease Control and Prevention (CDC)," Vaccine, Review vol. 29, no. 49, pp. 9171-6, 2011. | USA–HIC | None specifically |
| M. S. Blecher et al., "Financing vaccinations - the South African experience. (Special Issue: Introducing new vaccines into the South African national immunisation programme - a case study.)," Vaccine, vol. 30, no. Suppl. 3, pp. C79-C86, 2012. | South Africa–UMIC | PCV, Rotavirus |
| A. Brooks and A. Ba-Nguz, "Country planning for health interventions under development: lessons from the malaria vaccine decision-making framework and implications for other new interventions," Health Policy & Planning, vol. 27 Suppl 2, pp. ii50-61, 2012. | African countries, Global–Gaviand non-Gavi supported countries | Malaria |
| H. Y. Cho, "An overview of the national immunization policy making process: the role of the Korea expert committee on immunization practices," Korean Journal of Pediatrics, vol. 55, no. 1, pp. 1-5, 2012. | South Korea–HIC | None specifically |
| M. Georgousakis, S. Jayasinghe, J. Brotherton, N. Gilroy, C. Chiu, and K. Macartney, "Population-wide vaccination against human papillomavirus in adolescent boys: Australia as a case study," The Lancet Infectious Diseases, vol. 12, no. 8, pp. 627-34, 2012. | Australia–HIC | HPV |
| N. J. Ngcobo and N. A. Cameron, "The decision making process on new vaccines introduction in South Africa," Vaccine, Review vol. 30 Suppl 3, pp. C9-13, 2012. | South Africa–UMIC | None specifically |
| B. D. Schoub, "Introduction of inactivated polio vaccine (IPV) into the routine immunization schedule of South Africa," Vaccine, Review vol. 30 Suppl 3, pp. C35-7, 2012. | South Africa–UMIC | IPV |
| I. Ahout, G. Ferwerda, and R. de Groot, "Influenza vaccination in kids, are you kidding me?," Journal of Infection, Review vol. 68 Suppl 1, pp. S100-7, 2014. | The Netherlands–HIC | Influenza |
| M. Betancourt-Cravioto, P. Kuri-Morales, J. F. Gonzalez-Roldan, R. Tapia-Conyer, and G. Mexican Dengue Expert, "Introducing a dengue vaccine to Mexico: development of a system for evidence-based public policy recommendations," PLoS Neglected Tropical Diseases [electronic resource], vol. 8, no. 7, p. e3009, 2014. | Mexico–UMIC | Dengue |
| C. M. Domingues, S. de Fatima Pereira, A. C. Cunha Marreiros, N. Menezes, and B. Flannery, "Introduction of sequential inactivated polio vaccine-oral polio vaccine schedule for routine infant immunization in Brazil's National Immunization Program," Journal of Infectious Diseases, vol. 210 Suppl 1, pp. S143-51, 2014. | Brazil–UMIC | IPV |
| L. H. Falleiros-Arlant, M. L. Avila-Aguero, J. Brea del Castillo, and C. Marino, "The challenge of changing the inactivated poliomyelitis vaccine in Latin America: declaration of the Latin American Society of Pediatric Infectious Diseases (SLIPE)," Revista Chilena de Infectologia, vol. 31, no. 5, pp. 590-603, 2014. | Latin American countries–Gavi and non-Gavi supported countries | IPV |
| T. S. Rao, A. Rashmi, K. Ajay, J. E. Tate, U. Parashar, and K. Gagandeep, "Insights from global data for use of rotavirus vaccines in India. (Special Issue: Rotavirus in India: an update on epidemiology and vaccines.)," Vaccine, vol. 32, no. Suppl.1, pp. A171-A178, 2014. | India–LMIC Gavi supported | Rotavirus |
| D. Stecher et al., "National Immunization Commission: strengthening evidence-based decision making in Argentina," Vaccine, vol. 32, no. 16, pp. 1778-80, 2014. | Argentina–UMIC | None specifically |
| C. Phelps, G. Madhavan, R. Rappuoli, S. Levin, E. Shortliffe, and R. Colwell, "Strategic Planning in Population Health and Public Health Practice: A Call to Action for Higher Education," Milbank Quarterly, vol. 94, no. 1, pp. 109-25, 2016. | Global–Gavi and non-Gavi supported countries | None specifically |
| K. Seib et al., "Policy making for vaccine use as a driver of vaccine innovation and development in the developed world," Vaccine, Review vol. 35, no. 10, pp. 1380-1389, 2017 | US, UK, Canada, Australia–HIC | None specifically |
| J. Dawa et al., "Developing a seasonal influenza vaccine recommendation in Kenya: Process and challenges faced by the National Immunization Technical Advisory Group (NITAG),P.H.S. vol. 37, no. 3, pp. 464-472, 2019 | Kenya–LMIC Gavi supported | Seasonal influenza |
| P. De Wals, M. E. Espinoza-Moya, and D. Beland, "Kingdon's Multiple Streams Framework and the Analysis of Decision-Making Processes Regarding Publicly-Funded Immunization Programs," Expert Review of Vaccines, Review vol. 18, no. 6, pp. 575-585, 2019 | Canada–HIC | None specifically |
| D. Floret, "[The development of vaccination policy]," Revue des Maladies Respiratoires, Review vol. 36, no. 9, pp. 1038-1046, 2019. Elaboration de la politique vaccinale | France–HIC | None specifically |
| W. Rattanavipapong et al., "Comparing 3 Approaches for Making Vaccine Adoption Decisions in Thailand," International Journal of Health Policy & Management, vol. 20, p. 20, 2020. | Thailand–UMIC | Rotavirus |
| A. Sekhar and G. Kang, "Pathways to a policy for cholera control in India," Vaccine, Review vol. 38 Suppl 1, pp. A157-A159, 2020 | India–LMIC Gavi supported | Cholera |
| S. Taychakhoonavudh, W. Chumchujan, R. Hutubessy, and N. Chaiyakunapruk, "Landscape of vaccine access and health technology assessment role in decision-making process in ASEAN countries," Human vaccines & Immunotherapeutics, vol. 16, no. 7, pp. 1728-1737, 2020 | Association of Southeast Asian Nations (ASEAN) countries–Gavi and non-Gavi supported countries | None specifically |

Definitions: LIC, Low Income Country; LMIC, Lower-Middle Income Country; UMIC, Upper-Middle Income Country; HIC, High Income Country; Gavi, Gavi, the Vaccine Alliance; HBV, Hepatitis B vaccine; HPV, Human Papillomavirus vaccine; Hib, *Haemophilus influenzae* type b vaccine; PCV, pneumococcal conjugate vaccine; IPV, Inactivated Polio vaccine

* Type 2–Empirical studies and examples of decision-making

|  |  |  |  |
| --- | --- | --- | --- |
| **Study** | **Type of article** | **Country and country income level** | **Vaccine** |
| M. Arbyn, C. Simoens, P. Van Damme, A. Scharpantgen, C. J. Meijer, and P. Beutels, "Introduction of human papillomavirus vaccination in Belgium, Luxembourg and the Netherlands," Gynecologic & Obstetric Investigation, vol. 70, no. 4, pp. 224-32, 2010. | Empirical study | Belgium, Luxembourg, and the Netherlands–HIC | HPV |
| S. Blume and J. Tump, "Evidence and policymaking: The introduction of MMR vaccine in the Netherlands," *Social Science & Medicine,* vol. 71, no. 6, pp. 1049-55, 2010. | Empirical study | The Netherlands–HIC | MMR |
| R. A. Hajjeh *et al.*, "Supporting new vaccine introduction decisions: lessons learned from the Hib Initiative experience," *Vaccine,* vol. 28, no. 43, pp. 7123-9, 2010. | Example of decision-making | LIC and LMIC, all Gavi supported countries | Hib |
| P. Jacobs and A. Ohinmaa, "A comparison of the use of economics in vaccine expert reviews," *Vaccine,* Comparative Study vol. 28, no. 16, pp. 2841-5, 2010. | Example of decision-making | Australia, Belgium, England, Finland, France, Hong Kong, the Netherlands, New Zealand, Sweden and the USA–HIC | None specifically |
| N. Nguyen Quy *et al.*, "Human papillomavirus vaccine introduction in Vietnam: formative research findings. (Special Issue: Human papillomavirus.)," *Sexual Health,* vol. 7, no. 3, pp. 262-270, 2010. | Empirical study | Mali and South Africa–LIC Gavi and LMIC non-Gavi | HPV |
| M. Pineros, C. Wiesner, C. Cortes, and L. M. Trujillo, "HPV vaccine introduction at the local level in a developing country: attitudes and criteria among key actors," *Cadernos de Saude Publica,* vol. 26, no. 5, pp. 900-8, 2010. | Empirical study | Colombia–UMIC | HPV |
| B. Piso, I. Zechmeister, and S. Geiger-Gritsch, "Criteria for vaccine introduction: Results of a DELPHI discussion among international immunisation experts on a stepwise decision-making procedure," *Journal of Public Health,* vol. 19, no. 1, pp. 73-80, February 2011. | Empirical study | Australia, Austria, Belgium, Brazil, Canada, Germany, Spain, Sweden, UK, USA, Global–all non-Gavi supported countries | None specifically |
| H. E. D. Burchett *et al.*, "New vaccine adoption: Qualitative study of national decision-making processes in seven low- and middle-income countries," *Health Policy and Planning,* Article vol. 27, no. SUPPL.2, pp. ii5-ii16, 2012. | Empirical study | Bangladesh, Cameroon, Ethiopia, Guatemala, Kenya–LMIC, Gavi and non-Gavi supported countries | None specifically |
| S. A. Madhi, C. Cohen, and A. v. Gottberg, "Introduction of pneumococcal conjugate vaccine into the public immunization program in South Africa: translating research into policy.," *Vaccine,* vol. 30, no. Suppl. 3, pp. C21-C27, 2012. | Example of decision-making | South Africa–UMIC | PCV |
| M. Makinen, M. Kaddar, V. Molldrem, and L. Wilson, "New vaccine adoption in lower-middle-income countries," *Health Policy and Planning,* Article vol. 27, no. SUPPL.2, pp. ii39-ii49, 2012. | Empirical study | Armenia, China, Ecuador, Egypt, Indonesia, Morocco, Syria, Cape Verde, Philippines, Panama, Thailand, Turkey, Albania, South Africa, Tunisia–LMIC and UMIC, Gavi and non-Gavi supported countries | None specifically |
| I. Perez Schael *et al.*, "Clinical development, registration, and introduction of human rotavirus vaccine: The Latin American experience," *Trials in Vaccinology,* vol. 1, pp. 10-20, 2012. | Example of decision-making | Latin American countries, Global–Gaviand non-Gavi supported countries | Rotavirus |
| B. Vikas and S. Anoop, "Agenda setting in vaccine policy and social relevance of the emerging vaccine technologies from public health perspective - Part 1," *International Journal of Medicine and Public Health,* vol. 2, no. 1, pp. 7-15, 2012. | Empirical study | India–LMIC Gavi supported | None specifically |
| L. H. de Oliveira et al., "Systematic documentation of new vaccine introduction in selected countries of the Latin American Region," Vaccine, vol. 31 Suppl 3, pp. C114-22, 2013. | Empirical study | Bolivia, Brazil, Nicaragua, Peru, and Venezuela–LMIC and UMIC, Gavi and non-Gavi supported countries | Rotavirus, PCV |
| D. L. Douglas, D. A. DeRoeck, R. T. Mahoney, and O. Wichmann, "Will Dengue Vaccines Be Used in the Public Sector and if so, How? Findings from an 8-country Survey of Policymakers and Opinion Leaders," *PLoS Neglected Tropical Diseases,* Article vol. 7, no. 3, 2013, Art. no. e2127. | Empirical study | India, Sri Lanka, Thailand, Vietnam, Global–Gavi and non-Gavi supported countries | Dengue |
| J. Koch *et al.*, "Background paper to the recommendation for routine rotavirus vaccination of infants in Germany," *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz,* vol. 56, no. 7, pp. 957-84, 2013. | Empirical study | Germany–HIC | Rotavirus |
| H. Nohynek, O. Wichmann, D. A. F, and V. N. Gatekeepers, "National Advisory Groups and their role in immunization policy-making processes in European countries," *Clinical Microbiology & Infection,* Review vol. 19, no. 12, pp. 1096-105, 2013. | Empirical study | European countries–Global | None specifically |
| L. C. Rosella *et al.*, "Pandemic H1N1 in Canada and the use of evidence in developing public health policies - a policy analysis," *Social Science & Medicine,* vol. 83, pp. 1-9, 2013. | Empirical study | Canada–HIC | Influenza |
| G. Samaan, M. McPherson, and J. Partridge, "A review of the evidence to support influenza vaccine introduction in countries and areas of WHO's Western Pacific Region," *PLoS ONE [Electronic Resource],* Review vol. 8, no. 7, p. e70003, 2013. | Empirical study | Countries of the WHO Western Pacific Region–Gavi and non-Gavi supported countries | None specifically |
| J. Uddin, H. Sarma, T. I. Bari, and T. P. Koehlmoos, "Introduction of new vaccines: decision-making process in Bangladesh," *Journal of Health, Population & Nutrition,* vol. 31, no. 2, pp. 211-7, 2013. | Empirical study | Bangladesh–LMIC Gavi supported | None specifically |
| C. G. Whitney and U. D. Parashar, "What do policy makers need to know? Lessons from the decision to add pneumococcal conjugate and rotavirus vaccines to the US immunization program," *Vaccine,* vol. 31, no. Suppl. 3, pp. C6-C7, 2013. | Example of decision-making | USA–HIC | Rotavirus, PCV |
| Y. J. Choe *et al.*, "Prioritization of the introduction of new vaccines to the national immunization program in the Republic of Korea," *Vaccine,* Article vol. 32, no. 46, pp. 6049-6053, 2014. | Empirical study | South Korea–HIC | Hib, PCV, Rotavirus, HPV |
| C. B. Nelson, V. Mogasale, T. I. Bari, and J. D. Clemens, "Considerations around the introduction of a cholera vaccine in Bangladesh," Vaccine, vol. 32, no. 52, pp. 7033-6, 2014. | Example of decision-making | Bangladesh–LMIC Gavi supported | Cholera |
| L. J. Nyirenda, K. I. Sandberg, and J. Justice, "When are health systems ready for new vaccines? the introduction of pneumococcal vaccine in Malawi," *Forum for Development Studies,* Article vol. 41, no. 2, pp. 317-336, 2014. | Empirical study | Malawi–LIC Gavi supported | PCV |
| S. Ozawa *et al.*, "Evidence-to-policy gap on hepatitis A vaccine adoption in 6 countries: Literature vs. policymakers' beliefs," *Vaccine,* Review vol. 32, no. 32, pp. 4089-96, 2014. | Empirical study | Chile, India, South Korea, Mexico, Russia, Taiwan, Global–Gavi and non-Gavi supported countries | HAV |
| S. Panda, A. Das, and S. Samanta, "Synthesizing evidences for policy translation: a public health discourse on rotavirus vaccine in India," Vaccine, Review vol. 32 Suppl 1, pp. A162-70, 2014. | Empirical study | India–LMIC Gavi supported | Rotavirus |
| A. Rivero-Santana, L. Cuellar-Pompa, L. M. Sanchez-Gomez, L. Perestelo-Perez, and P. Serrano-Aguilar, "Effectiveness and cost-effectiveness of different immunization strategies against whooping cough to reduce child morbidity and mortality," Health Policy, vol. 115, no. 1, pp. 82-91, 2014. | Example of decision-making | Spain–HIC | Tdap |
| M. González-Lorenzo *et al.*, "Conceptual frameworks and key dimensions to support coverage decisions for vaccines," *Vaccine,* Article vol. 33, no. 9, pp. 1206-1217, 2015. | Empirical study | Italy–HIC | None specifically |
| I. M. Van Der Putten, S. M. A. A. Evers, R. Deogaonkar, M. Jit, and R. C. W. Hutubessy, "Stakeholders' perception on including broader economic impact of vaccines in economic evaluations in low and middle income countries: A mixed methods study," *BMC Public Health,* Article vol. 15, no. 1, 2015, Art. no. 356. | Empirical study | Global–Gavi and non-Gavi supported countries | None specifically |
| P. F. Hadisoemarto, M. R. Reich, and M. C. Castro, "Introduction of pentavalent vaccine in Indonesia: a policy analysis," *Health Policy & Planning,* vol. 31, no. 8, pp. 1079-88, 2016. | Empirical study | Indonesia–LMIC Gavi supported | Pentavalent |
| A. Limia-Sanchez, M. M. Andreu, V. Torres de Mier Mde, J. A. Navarro-Alonso, and S. Working Group on Review of the Immunization, "[Toward a New Immunization Schedule in Spain, 2016 (Part 1)]," *Revista Espanola de Salud Publica,* vol. 90, p. E2, 2016. | Example of decision-making | Spain–HIC | Pentavalent |
| A. Parrella et al., "Prioritizing government funding of adolescent vaccinations: Recommendations from young people on a citizens' jury," Vaccine, Article vol. 34, no. 31, pp. 3592-3597, 2016. | Empirical study | Australia–HIC | None specifically |
| S. Pooripussarakul, A. Riewpaiboon, D. Bishai, C. Muangchana, and S. Tantivess, "What criteria do decision makers in Thailand use to set priorities for vaccine introduction?," *BMC Public Health,* Article vol. 16, no. 1, 2016, Art. no. 684. | Empirical study | Thailand–UMIC | None specifically |
| I. Romore *et al.*, "Policy analysis for deciding on a malaria vaccine RTS,S in Tanzania," *Malaria Journal,* vol. 15, p. 143, 2016. | Empirical study | Tanzania–LMIC Gavi supported | Malaria |
| E. A. Williams, D. J. Lewis, S. Bertholet, and M. Zazzi, "Anticipating policy considerations for a future HIV vaccine: a preliminary study," *Vaccine,* vol. 34, no. 32, pp. 3697-701, 2016. | Empirical study | Kenya, United Kingdom, Brazil, Mali, South Sudan, Uganda, and Zambia, Global–Gavi and non-Gavi supported countries | HIV |
| A. Ba-Nguz, A. Adjagba, T. W. Hendrarto, N. K. Sewankambo, C. Nalwadda, and A. Kisakye, "The role of National Immunization Technical Advisory Groups (NITAGs) in the introduction of inactivated polio vaccine: experience of the Indonesia and Uganda NITAGs.," Journal of Infectious Diseases, vol. 216, no. Suppl. 1, pp. S109-S113, 2017 | Example of decision-making | Indonesia–LMIC; Uganda–LIC Gavi and non-Gavi supported countries | IPV |
| A. Caro Martinez et al., "Adoption of the HPV vaccine: A case study of three emerging countries," Journal of Comparative Effectiveness Research, vol. 6, no. 3, pp. 195-204, May 2017 | Empirical study | Poland–HIC, Colombia–UMIC, Brazil–UMIC | HPV |
| S. Scotney et al., "Succeeding in New Vaccine Introduction: Lessons Learned from the Introduction of Inactivated Poliovirus Vaccine in Cameroon, Kenya, and Nigeria," Journal of Infectious Diseases, Article vol. 216, pp. S130-S136, 2017 | Example of decision-making | Cameroon, Kenya, and Nigeria–LMICs Gavi supported | IPV |
| L. Wallace and L. Kapirir, "How Are New Vaccines Prioritized in Low-Income Countries? A Case Study of Human Papilloma Virus Vaccine and Pneumococcal Conjugate Vaccine in Uganda," International Journal of Health Policy & Management, vol. 6, no. 12, pp. 707-720, 2017 | Empirical study | Uganda–LIC Gavi supported | HPV, Pneumococcal |
| A. Z. Hasan et al., "Using pneumococcal and rotavirus surveillance in vaccine decision-making: A series of case studies in Bangladesh, Armenia and the Gambia," Vaccine, vol. 36, no. 32 Pt B, pp. 4939-4943, 2018 | Example of decision-making | Bangladesh–LMIC, Armenia–LMIC, the Gambia–LIC Gavi and non-Gavi supported countries | Pneumococcal, Rotavirus |
| N. Howard, H. Walls, S. Bell, and S. Mounier-Jack, "The role of National Immunisation Technical Advisory Groups (NITAGs) in strengthening national vaccine decision-making: A comparative case study of Armenia, Ghana, Indonesia, Nigeria, Senegal and Uganda," Vaccine, vol. 36, no. 37, pp. 5536-5543, 2018 | Empirical study | Armenia–LMIC, Ghana–LMIC, Indonesia–LMIC, Nigeria–LMIC, Senegal–LIC, Uganda–LIC Gavi and non-Gavi supported countries | None specifically |
| G. St-Martin, A. Lindstrand, S. Sandbu, and T. K. Fischer, "Selection and Interpretation of Scientific Evidence in Preparation for Policy Decisions: A Case Study Regarding Introduction of Rotavirus Vaccine Into National Immunization Programs in Sweden, Norway, Finland, and Denmark," Frontiers in Public Health, vol. 6, p. 131, 2018 | Empirical study | Sweden, Norway, Finland, Denmark–HICs | Rotavirus |
| R. Chen and E. Wong, "The feasibility of universal HPV vaccination program in Shenzhen of China: a health policy analysis," BMC Public Health, vol. 19, no. 1, p. 781, 2019 | Empirical study | China–UMIC | HPV |
| A. Malik et al., "Introducing rotavirus vaccine in the Universal Immunization Programme in India: From evidence to policy to implementation," Vaccine, Review vol. 37, no. 39, pp. 5817-5824, 2019 | Example of decision-making | India–LMIC Gavi supported | Rotavirus |
| S. Mandal, "Introduction of universal infant hepatitis B immunisation in the UK- paving the way to elimination," Human vaccines & Immunotherapeutics, vol. 15, no. 2, pp. 440-443, 2019 | Example of decision-making | UK–HIC | HBV |
| I. M. van der Putten, A. T. G. Paulus, M. Hiligsmann, R. C. W. Hutubessy, and S. Evers, "Evidence-informed vaccine decision making: The introduction of Human Papilloma Virus (HPV) vaccination in the Netherlands," Health Policy, Research Support, Non-U.S. Gov't vol. 123, no. 3, pp. 260-266, 2019 | Empirical study | the Netherlands–HIC | HPV |

Definitions: LIC, Low Income Country; LMIC, Lower-Middle Income Country; UMIC, Upper-Middle Income Country; HIC, High Income Country; Gavi, Gavi, the Vaccine Alliance; MMR, Measles Mumps Rubella vaccine; HBV, Hepatitis B virus vaccine; HPV, Human Papillomavirus vaccine; Hib, *Haemophilus influenzae* type b vaccine; PCV, pneumococcal conjugate vaccine; IPV, Inactivated Polio vaccine; HAV, Hepatitis A virus vaccine; HIV, Human Immunodeficiency virus vaccine; Tdap, Tetanus diphtheria and acellular pertussis vaccine

* Type 3–Theoretical and empirical articles that provide insights into the vaccine policy-making process

|  |  |  |
| --- | --- | --- |
| **Article** | **Country and country income level** | **Vaccine focus** |
| Y. Madhavi et al., "Evidence-based National Vaccine Policy," Indian Journal of Medical Research, vol. 131, pp. 617-28, 2010. | India–LMIC Gavi supported | None specifically |
| L. Chocarro, P. Duclos, K. Senouci, and J. Southern, "Consultation on interactions between National Regulatory Authorities and National Immunization Technical Advisory Groups," Expert Review of Vaccines, Congresses vol. 10, no. 9, pp. 1265-70, 2011. | LMIC, Gavi and non-Gavi supported countries | None specifically |
| G. La Torre et al., "Guidance for future HTA applications to vaccines: the HPV lesson," Human Vaccines, Review vol. 7, no. 9, pp. 900-4, 2011. | Italy–HIC | HPV |
| P. L. Zuber et al., "Sustaining GAVI-supported vaccine introductions in resource-poor countries," Vaccine, vol. 29, no. 17, pp. 3149-54, 2011. | LMIC Gavi supported | HBV, Hib |
| W. S. Gordon, A. Jones, and J. Wecker, "Introducing multiple vaccines in low- and lower-middle-income countries: issues, opportunities and challenges," Health Policy & Planning, Research Support, U.S. Gov't, Non-P.H.S. vol. 27 Suppl 2, pp. ii17-26, 2012. | LIC, LMIC Gavi supported | None specifically |
| C. B. Wonodi et al., "Using social network analysis to examine the decision-making process on new vaccine introduction in Nigeria," Health Policy & Planning, Research Support, Non-U.S. Gov't vol. 27 Suppl 2, pp. ii27-38, 2012. | Nigeria–LMIC Gavi supported | None specifically |
| A. R. Hinman, "Perspectives on sustainable vaccine introduction," Vaccine, vol. 31 Suppl 3, pp. C8-9, 2013. | Countries of the WHO Region of the Americas–Gavi and non-Gavi supported countries | None specifically |
| S. A. Wang et al., "New vaccine introductions: assessing the impact and the opportunities for immunization and health systems strengthening," Vaccine, Review vol. 31 Suppl 2, pp. B122-8, 2013. | Global–Gavi and non-Gavi supported countries | None specifically |
| L. R. Walton, W. A. Orenstein, and L. K. Pickering, "The history of the United States Advisory Committee on Immunization Practices (ACIP)," Vaccine, Historical Article vol. 33, no. 3, pp. 405-14, 2015. | USA–HIC | None specifically |
| L. H. de Oliveira, S. P. Trumbo, C. Ruiz Matus, N. J. Sanwogou, and C. M. Toscano, "Pneumococcal conjugate vaccine introduction in Latin America and the Caribbean: progress and lessons learned," Expert Review of Vaccines, vol. 15, no. 10, pp. 1295-304, 2016. | Latin American countries and the Caribbean–Gavi and non-Gavi supported countries | PCV |
| M. Gatera et al., "Successive introduction of four new vaccines in Rwanda: High coverage and rapid scale up of Rwanda's expanded immunization program from 2009 to 2013," Vaccine, vol. 34, no. 29, pp. 3420-6, 2016. | Rwanda–LMIC Gavi supported | HPV, PCV, Rotavirus |
| A. F. Baleta, J. v. d. Heever, and R. J. Burnett, "Meeting the need for advocacy, social mobilisation and communication in the introduction of three new vaccines in South Africa - successes and challenges," Vaccine, vol. 30, no. Suppl. 3, pp. C66-C71, 2012. | South Africa–UMIC | Rotavirus, PCV, Pentavalent with IPV |
| T. Barnighausen et al., "Rethinking the benefits and costs of childhood vaccination: the example of the Haemophilus influenzae type b vaccine," Vaccine, vol. 29, no. 13, pp. 2371-80, 2011. | Global–Gavi and non-Gavi supported countries | Hib |
| R. M. Bartolini et al., "Formative research to shape HPV vaccine introduction strategies in Peru," Salud Publica de Mexico, vol. 52, no. 3, pp. 226-33, 2010. | Peru–UMIC | HPV |
| D. E. Bloom, "Valuing vaccines: deficiencies and remedies," Vaccine, Review vol. 33 Suppl 2, pp. B29-33, 2015. | Global–Gavi and non-Gavi supported countries | None specifically |
| D. E. Bloom and G. Madhavan, "Vaccines: from valuation to resource allocation," Vaccine, Review vol. 33 Suppl 2, pp. B52-4, 2015. | Global–Gavi and non-Gavi supported countries | None specifically |
| B. E. Chauke-Moagi and M. Mumba, "New vaccine introduction in the East and Southern African sub-region of the WHO African region in the context of GIVS and MDGs," Vaccine, Review vol. 30 Suppl 3, pp. C3-8, 2012. | Countries in the East and Southern African sub-region of the WHO African region | Rotavirus, HPV, Hib, HBV, PCV |
| C. de Quadros, "Historical perspectives on new vaccine introduction in Latin America and the Caribbean," Vaccine, vol. 31 Suppl 3, pp. C4-5, 2013. | Countries of the WHO Region of the Americas–Gavi and non-Gavi supported countries | None specifically |
| P. Duclos, J. M. Okwo-Bele, and D. Salisbury, "Establishing global policy recommendations: the role of the Strategic Advisory Group of Experts on immunization," Expert Review of Vaccines, Review vol. 10, no. 2, pp. 163-73, 2011. | Global–Gavi and non-Gavi supported countries | None specifically |
| A. Glassman, "Beyond methods and studies: building institutions for better public spending on vaccination," Vaccine, vol. 31, no. Suppl. 3, pp. C10-C11, 2013. | Countries of the WHO Region of the Americas–Gavi and non-Gavi supported countries | Rotavirus, HPV, PCV |
| A. Glatman-Freedman et al., "Factors affecting the introduction of new vaccines to poor nations: a comparative study of the Haemophilus influenzae type B and hepatitis B vaccines," PLoS ONE, Comparative Study vol. 5, no. 11, p. e13802, 2010. | Countries of the WHO African region–LIC and LMIC, Gavi supported countries | Hib, HBV |
| R. Hajjeh, "Accelerating introduction of new vaccines: barriers to introduction and lessons learned from the recent Haemophilus influenzae type B vaccine experience," Philosophical Transactions of the Royal Society of London - Series B: Biological Sciences, Review vol. 366, no. 1579, pp. 2827-32, 2011. | Global– LIC and LMIC, Gavi supported countries | Hib |
| S. Hawkes, E. Kismodi, H. Larson, and K. Buse, "Vaccines to promote and protect sexual health: policy challenges and opportunities," Vaccine, Review vol. 32, no. 14, pp. 1610-5, 2014. | Global–Gavi and non-Gavi supported countries | HPV |
| B. Jauregui et al., "Strengthening the technical capacity at country-level to make informed policy decisions on new vaccine introduction: lessons learned by PAHO's ProVac Initiative," Vaccine, vol. 29, no. 5, pp. 1099-106, 2011 | Countries of the WHO Region of the Americas–Gavi and non-Gavi supported countries | RV, HPV, PCV |
| B. Jauregui et al., "Evidence-based decision-making for vaccine introductions: Overview of the ProVac International Working Group's experience," Vaccine, vol. 33 Suppl 1, pp. A28-33, 2015. | Countries of the WHO Region of the Americas–Gavi and non-Gavi supported countries | RV, HPV, PCV |
| B. Jauregui et al., "ProVac Global Initiative: a vision shaped by ten years of supporting evidence-based policy decisions," Vaccine, vol. 33 Suppl 1, pp. A21-7, 2015. | Countries of the WHO Region of the Americas–Gavi and non-Gavi supported countries | RV, HPV, PCV |
| M. A. Kane, B. Serrano, S. de Sanjose, and S. Wittet, "Implementation of human papillomavirus immunization in the developing world," Vaccine, Review vol. 30 Suppl 5, pp. F192-200, 2012. | Global–LIC and LMIC, Gavi supported countries | HPV |
| A. D. Koon, K. D. Rao, N. T. Tran, and A. Ghaffar, "Embedding health policy and systems research into decision-making processes in low- and middle-income countries," Health Research Policy and Systems, Review vol. 11, no. 1, 2013, Art. no. 30. | Global–LIC and LMIC, Gavi supported countries | None specifically |
| V. Laurent-Ledru, A. Thomson, and J. Monsonego, "Civil society: a critical new advocate for vaccination in Europe," Vaccine, Review vol. 29, no. 4, pp. 624-8, 2011. | Countries of the WHO European Region–Gavi and non-Gavi supported countries | HPV |
| O. S. Levine et al., "The future of immunisation policy, implementation, and financing," Lancet, vol. 378, no. 9789, pp. 439-48, 2011. | Global–Gavi and non-Gavi supported countries | None specifically |
| C. Mantel and S. A. Wang, "The privilege and responsibility of having choices: Decision-making for new vaccines in developing countries," Health Policy and Planning, Review vol. 27, no. SUPPL.2, pp. ii1-ii4, 2012. | Global–LIC and MIC, Gavi and non-Gavi supported countries | None specifically |
| N. Q. Nghi et al., "Human papillomavirus vaccine introduction in Vietnam: formative research findings," Sexual Health, Research Support, Non-U.S. Gov't vol. 7, no. 3, pp. 262-70, 2010. | Vietnam–LMIC, Gavi supported country | HPV |
| C. Perronne et al., "Implementing efficient and sustainable collaboration between National Immunization Technical Advisory Groups: Report on the 3rd International Technical Meeting, Paris, France, 8-9 December 2014," Vaccine, vol. 34, no. 11, pp. 1325-30, 2016. | Global–Gavi and non-Gavi supported countries | None specifically |
| K. I. Sandberg, S. Andresen, and G. Bjune, "A new approach to global health institutions? A case study of new vaccine introduction and the formation of the GAVI Alliance," Social Science & Medicine, vol. 71, no. 7, pp. 1349-56, 2010. | Global–Gavi and non-Gavi supported countries | Hib |
| K. Senouci et al., "The Supporting Independent Immunization and Vaccine Advisory Committees (SIVAC) Initiative: a country-driven, multi-partner program to support evidence-based decision making.," Vaccine, vol. 28, no. Supplement 1, pp. A26-A30, 2010. | Global–Gavi and non-Gavi supported countries | None specifically |
| K. Senouci, P. C. Faye, J. Blau, A. d. Silva, and B. Gessner, "Implementation of national immmunization technical advisory groups: countries' ownership of priority setting and decision-making for immunization programs and policies," Revue Medecine Tropicale, vol. 71, no. 4, pp. 363-366, 2011 | Global–Gavi and non-Gavi supported countries | None specifically |
| J. C. Shearer, M. L. Stack, M. R. Richmond, A. P. Bear, R. A. Hajjeh, and D. M. Bishai, "Accelerating policy decisions to adopt haemophilus influenzae type B vaccine: a global, multivariable analysis," PLoS Medicine / Public Library of Science, vol. 7, no. 3, p. e1000249, 2010. | Global–LIC and MIC, Gavi and non-Gavi supported countries | Hib |
| R. Tapia-Conyer, M. Betancourt-Cravioto, R. Saucedo-Martinez, L. Motta-Murguia, and H. Gallardo-Rincon, "Strengthening vaccination policies in Latin America: an evidence-based approach," Vaccine, Review vol. 31, no. 37, pp. 3826-33, 2013. | Countries of the WHO Region of the Americas–Gavi and non-Gavi supported countries | None specifically |
| C. M. Toscano et al., "Cost analysis of an integrated vaccine-preventable disease surveillance system in Costa Rica," Vaccine, Review vol. 31 Suppl 3, pp. C88-93, 2013. | Countries of the WHO Region of the Americas–Gavi and non-Gavi supported countries | None specifically |
| H. Yamashiro, N. Cutcliffe, S. Dobson, D. Fisman, and R. Gold, "The role of pediatricians as key stakeholders in influencing immunization policy decisions for the introduction of meningitis B vaccine in Canada: The Ontario perspective," The Canadian Journal of Infectious Diseases & Medical Microbiology, vol. 26, no. 4, pp. 183-90, 2015. | Canada–HIC | Meningitis B |
| M. Kaddar, S. Schmitt, M. Makinen, and J. Milstien, "Global support for new vaccine implementation in middle-income countries," Vaccine, Review vol. 31 Suppl 2, pp. B81-96, 2013. | Global–MIC, Gavi and non-Gavi supported countries | Hib, PCV, Rotavirus, HPV |
| D. Abdoulaye Alfa, R. A. Houngnihin, G. P. Ilboudo, N. Dick, L. Kaucley, and T. A. Essoh, "Introduction of multi-dose PCV 13 vaccine in Benin: from the decision to vaccinators experience," BMC Public Health, vol. 20, no. 1, p. 1216, 2020 | Benin–LIC, Gavi supported country | PCV |
| K. Date et al., "Decision Making and Implementation of the First Public Sector Introduction of Typhoid Conjugate Vaccine-Navi Mumbai, India, 2018," Clinical Infectious Diseases, vol. 71, no. Supplement\_2, pp. S172-S178, 2020 | India–LMICGavi supported | TCV |
| S. Lang, S. Loving, N. D. McCarthy, M. E. Ramsay, D. Salisbury, and A. J. Pollard, "Two centuries of immunisation in the UK (part II)," Archives of Disease in Childhood, Historical Article vol. 105, no. 3, pp. 216-222, 2020 | UK–HIC | None specifically |
| \*D. L. Douglas, D. A. DeRoeck, R. T. Mahoney, and O. Wichmann, "Will Dengue Vaccines Be Used in the Public Sector and if so, How? Findings from an 8-country Survey of Policymakers and Opinion Leaders," *PLoS Neglected Tropical Diseases,* Article vol. 7, no. 3, 2013, Art. no. e2127. | India, Sri Lanka, Thailand, Vietnam–Global, Gavi and non-Gavi supported countries | Dengue |
| \*M. Ceyhan, "Recent improvements in the Turkish Childhood National Immunization Program," Turkish Journal of Pediatrics, vol. 52, no. 6, pp. 563-9, 2010. | Turkey–UMIC | None specifically |
| \*T. J. John, "India's National Technical Advisory Group on Immunisation," Vaccine, vol. 28 Suppl 1, pp. A88-90, 2010. | India–LMICGavi supported | None specifically |
| \*L. H. Falleiros-Arlant, M. L. Avila-Aguero, J. Brea del Castillo, and C. Marino, "The challenge of changing the inactivated poliomyelitis vaccine in Latin America: declaration of the Latin American Society of Pediatric Infectious Diseases (SLIPE)," Revista Chilena de Infectologia, vol. 31, no. 5, pp. 590-603, 2014. | Latin American countries–Gavi and non-Gavi supported countries | IPV |
| \* P. F. Hadisoemarto, M. R. Reich, and M. C. Castro, "Introduction of pentavalent vaccine in Indonesia: a policy analysis," Health Policy & Planning, vol. 31, no. 8, pp. 1079-88, 2016 | Indonesia–LMIC | Pentavalent |
| \* A. Ba-Nguz, A. Adjagba, T. W. Hendrarto, N. K. Sewankambo, C. Nalwadda, and A. Kisakye, "The role of National Immunization Technical Advisory Groups (NITAGs) in the introduction of inactivated polio vaccine: experience of the Indonesia and Uganda NITAGs.," Journal of Infectious Diseases, vol. 216, no. Suppl. 1, pp. S109-S113, 2017 | Indonesia–LMIC; Uganda–LIC Gavi and non-Gavi supported countries | IPV |
| \* A. Caro Martinez et al., "Adoption of the HPV vaccine: A case study of three emerging countries," Journal of Comparative Effectiveness Research, vol. 6, no. 3, pp. 195-204, May 2017 | Poland–HIC, Colombia–UMIC, Brazil–UMIC | HPV |
| \* S. Scotney et al., "Succeeding in New Vaccine Introduction: Lessons Learned from the Introduction of Inactivated Poliovirus Vaccine in Cameroon, Kenya, and Nigeria," Journal of Infectious Diseases, Article vol. 216, pp. S130-S136, 2017 | Cameroon, Kenya, and Nigeria–LMICs Gavi supported | IPV |
| \* L. Wallace and L. Kapirir, "How Are New Vaccines Prioritized in Low-Income Countries? A Case Study of Human Papilloma Virus Vaccine and Pneumococcal Conjugate Vaccine in Uganda," International Journal of Health Policy & Management, vol. 6, no. 12, pp. 707-720, 2017 | Uganda–LIC Gavi supported | HPV, Pneumococcal |
| \* A. Z. Hasan et al., "Using pneumococcal and rotavirus surveillance in vaccine decision-making: A series of case studies in Bangladesh, Armenia and the Gambia," Vaccine, vol. 36, no. 32 Pt B, pp. 4939-4943, 2018 | Bangladesh–LMIC, Armenia–LMIC, the Gambia–LIC Gavi and non-Gavi supported countries | Pneumococcal, Rotavirus |
| \* N. Howard, H. Walls, S. Bell, and S. Mounier-Jack, "The role of National Immunisation Technical Advisory Groups (NITAGs) in strengthening national vaccine decision-making: A comparative case study of Armenia, Ghana, Indonesia, Nigeria, Senegal and Uganda," Vaccine, vol. 36, no. 37, pp. 5536-5543, 2018 | Armenia–LMIC, Ghana–LMIC, Indonesia–LMIC, Nigeria–LMIC, Senegal–LIC, Uganda–LIC Gavi and non-Gavi supported countries | None specifically |
| \* G. St-Martin, A. Lindstrand, S. Sandbu, and T. K. Fischer, "Selection and Interpretation of Scientific Evidence in Preparation for Policy Decisions: A Case Study Regarding Introduction of Rotavirus Vaccine Into National Immunization Programs in Sweden, Norway, Finland, and Denmark," Frontiers in Public Health, vol. 6, p. 131, 2018 | Sweden, Norway, Finland, Denmark–HICs | Rotavirus |
| \* A. Malik et al., "Introducing rotavirus vaccine in the Universal Immunization Programme in India: From evidence to policy to implementation," Vaccine, Review vol. 37, no. 39, pp. 5817-5824, 2019 | India–LMIC Gavi supported | Rotavirus |
| \* S. Mandal, "Introduction of universal infant hepatitis B immunisation in the UK- paving the way to elimination," Human vaccines & Immunotherapeutics, vol. 15, no. 2, pp. 440-443, 2019 | UK–HIC | HBV |
| \* I. M. van der Putten, A. T. G. Paulus, M. Hiligsmann, R. C. W. Hutubessy, and S. Evers, "Evidence-informed vaccine decision making: The introduction of Human Papilloma Virus (HPV) vaccination in the Netherlands," Health Policy, Research Support, Non-U.S. Gov't vol. 123, no. 3, pp. 260-266, 2019 | the Netherlands–HIC | HPV |
| \* A. Sekhar and G. Kang, "Pathways to a policy for cholera control in India," Vaccine, Review vol. 38 Suppl 1, pp. A157-A159, 2020 | India–LMIC Gavi supported | Cholera |
| \* S. Taychakhoonavudh, W. Chumchujan, R. Hutubessy, and N. Chaiyakunapruk, "Landscape of vaccine access and health technology assessment role in decision-making process in ASEAN countries," Human vaccines & Immunotherapeutics, vol. 16, no. 7, pp. 1728-1737, 2020 | Association of Southeast Asian Nations (ASEAN) countries–Gavi and non-Gavi supported countries | None specifically |

\*These articles were included in either type 1 or type 2 articles

Definitions: LIC, Low Income Country; LMIC, Lower-Middle Income Country; UMIC, Upper-Middle Income Country; HIC, High Income Country; Gavi, Gavi, the Vaccine Alliance; HBV, Hepatitis B virus vaccine; HPV, Human Papillomavirus vaccine; Hib, *Haemophilus influenzae* type b vaccine; PCV, pneumococcal conjugate vaccine; TCV, typhoid conjugate vaccine; IPV, Inactivated Polio vaccine; HAV, Hepatitis A virus vaccine; HIV, Human Immunodeficiency virus vaccine

**Appendix 5: Quality appraisal of the 27 studies that collect or analyze empirical data on vaccine introduction decision-making using the** **Mixed Methods Appraisal Tool (MMAT)**

* **3 articles using quantitative methods**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Article** | **Screening questions (ALL STUDY TYPES): Methodological quality criteria** | | **Type of study: Quantitative (descriptive)** | | | | **Total (%)** |
|  | Are there clear qualitative and quantitative research questions (or objectives), or a clear mixed methods question (or objective)? | Do collected data address the research question (objective)? e.g., consider whether the follow-up period is long enough for the outcome to occur (for longitudinal studies or study components). | Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed methods question)?  (e.g., consider whether (a) the source of sample is relevant to the population under study; (b) when appropriate, there is a standard procedure for sampling, and the sample size is justified-using power calculation, for instance). | Is the sample representative of the population under study?  (e.g., consider whether (a) inclusion and exclusion criteria are explained; and (b) reasons why certain eligible individuals chose not to participate are explained.) | Are measurements appropriate (clear origin, or validity known, or standard instrument)?  e.g., consider whether (a) the variables are clearly defined and accurately measured; (b) measurements are justified  and appropriate for answering the research question; and (c) the measurements reflect what they are supposed to measure. | Is there an acceptable response rate (60% or above)?  The response rate is not pertinent for case series and case report. (e.g., there is no expectation that a case series would include all patients in a similar situation.) |  |
| H. Nohynek, O. Wichmann, D. A. F, and V. N. Gatekeepers, "National Advisory Groups and their role in immunization policy-making processes in European countries," *Clinical Microbiology & Infection,* Review vol. 19, no. 12, pp. 1096-105, 2013. | Yes | Yes | Yes | Cannot tell.  No information on who the country focal points are. | No | Yes | 50 |
| Y. J. Choe et al., "Prioritization of the introduction of new vaccines to the national immunization program in the Republic of Korea," Vaccine, Article vol. 32, no. 46, pp. 6049-6053, 2014. | Yes | Yes | Yes | Cannot tell.  No information why some chose not to participate | Yes | Yes | 75 |
| E. A. Williams, D. J. Lewis, S. Bertholet, and M. Zazzi, "Anticipating policy considerations for a future HIV vaccine: a preliminary study," Vaccine, vol. 34, no. 32, pp. 3697-701, 2016. | Yes | Yes | Yes | No  No justification for not contacting EMRO, WPRO, SEARO | Yes | No | 50 |

* **21 articles using qualitative methods**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Article** | **Screening questions (ALL STUDY TYPES): Methodological quality criteria** | | **Type of study: Qualitative** | | | | **Total (%)** |
|  | Are there clear qualitative and quantitative research questions (or objectives), or a clear mixed methods question (or objective)? | Do collected data address the research question (objective)? E.g., consider whether the follow-up period is long enough for the outcome to occur (for longitudinal studies or study components). | Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question (objective)?  E.g., consider whether (a) the selection of the participants is clear, and appropriate to collect relevant and rich data; and (b) reasons why certain potential participants chose not to participate are explained. | Is the process for analyzing qualitative data relevant to address the research question (objective)?  E.g., consider whether (a) the method of data collection is clear (in depth interviews and/or group interviews, and/or observations and/or documentary sources); (b) the form of the data is clear (tape recording, video material, and/or field notes for instance); (c) changes are explained when methods are altered during the study; and (d) the qualitative data analysis addresses the question. | Is appropriate consideration given to how findings relate to the context, e.g., the setting, in which the data were collected? E.g., consider whether the study context and how findings relate to the context or characteristics of the context are explained (how findings are influenced by or influence the context). “For example, a researcher wishing to observe care in an acute hospital around the clock may not be able to study more than one hospital. (…) Here, it is essential to take care to describe the context and particulars of the case [the hospital] and to flag up for the reader the similarities and differences between the case and other settings of the same type” (Mays & Pope, 1995). The notion of context may be conceived in different ways depending on the approach (methodology) tradition. | Is appropriate consideration given to how findings relate to researchers’ influence, e.g., through their interactions with participants?  E.g., consider whether (a) researchers critically explain how findings relate to their perspective, role, and interactions with participants (how the research process is influenced by or influences the researcher); (b) researcher’s role is influential at all stages (formulation of a research question, data collection, data analysis and interpretation of findings); and (c) researchers explain their reaction to critical events  that occurred during the study. The notion of reflexivity may be conceived in different ways depending on the approach (methodology) tradition. E.g., “at a minimum, researchers employing a generic approach [qualitative description] must explicitly identify their disciplinary affiliation, what brought them to the question, and the assumptions they make about the topic of interest” (Caelli, Ray & Mill, 2003, p. 5). |  |
| M. Arbyn, C. Simoens, P. Van Damme, A. Scharpantgen, C. J. Meijer, and P. Beutels, "Introduction of human papillomavirus vaccination in Belgium, Luxembourg and the Netherlands," *Gynecologic & Obstetric Investigation,* vol. 70, no. 4, pp. 224-32, 2010. | Yes | Yes | Cannot tell  There is information on the data but not on the collection process | No  No information on the data analysis | Yes  Each country’s immunization-related context is described separately | No | 25 |
| S. Blume and J. Tump, "Evidence and policymaking: The introduction of MMR vaccine in the Netherlands," *Social Science & Medicine,* vol. 71, no. 6, pp. 1049-55, 2010. | Yes | Yes | Yes | Yes | Yes | Cannot tell | 75 |
| M. Pineros, C. Wiesner, C. Cortes, and L. M. Trujillo, "HPV vaccine introduction at the local level in a developing country: attitudes and criteria among key actors," Cadernos de Saude Publica, vol. 26, no. 5, pp. 900-8, 2010. | Yes | Yes | Yes | Yes  After checking the quality of the transcription, all team members read each text, and analyzed the data minutely into significant units. These units were grouped according to pre-established and emerging categories, identified by a triangulation process among researchers. The structural analysis was accomplished through conceptual and relational maps for each city and regions. | Yes  Interpretation took into account the categories, the particular context and was contrasted with existing scientific literature. | No | 75 |
| H. E. D. Burchett *et al.*, "New vaccine adoption: Qualitative study of national decision-making processes in seven low- and middle-income countries," *Health Policy and Planning,* Article vol. 27, no. SUPPL.2, pp. ii5-ii16, 2012. | Yes | Yes | Yes | Yes | Yes | Yes  One limitation reported is that the sensitive nature of decision-making may have led to some acquiescence bias and assumptions about the process. | 100 |
| M. Makinen, M. Kaddar, V. Molldrem, and L. Wilson, "New vaccine adoption in lower-middle-income countries," *Health Policy and Planning,* Article vol. 27, no. SUPPL.2, pp. ii39-ii49, 2012. | Yes | Yes | Yes | Yes | Yes | Cannot tell | 75 |
| D. L. Douglas, D. A. DeRoeck, R. T. Mahoney, and O. Wichmann, "Will Dengue Vaccines Be Used in the Public Sector and if so, How? Findings from an 8-country Survey of Policymakers and Opinion Leaders," *PLoS Neglected Tropical Diseases,* Article vol. 7, no. 3, 2013, Art. no. e2127. | Yes | Yes | Yes | Yes | Yes | Yes | 100 |
| L. H. de Oliveira *et al.*, "Systematic documentation of new vaccine introduction in selected countries of the Latin American Region," *Vaccine,* Observational Study Review vol. 31 Suppl 3, pp. C114-22, 2013. | Yes | Yes | Yes | No  Conducted an average of 10 interviews addressing select issues in each country | Yes | No  No limitation has been reported | 50 |
| L. C. Rosella *et al.*, "Pandemic H1N1 in Canada and the use of evidence in developing public health policies - a policy analysis," *Social Science & Medicine,* vol. 83, pp. 1-9, 2013. | Yes | Yes | Yes | Yes | Yes | Yes   * Multidirectional exchange with several individuals being both producers of information and decision-makers, which made it difficult to conceptually separate their unique influences. * Framework for analysis does not capture Canada’s hierarchical, jurisdictional, and institutional levels of decision-making and their interactions. * Placement of evidence ideology in the values component of the model can be questioned as it is reflective of a normative stance versus a value trait. | 100 |
| J. Uddin, H. Sarma, T. I. Bari, and T. P. Koehlmoos, "Introduction of new vaccines: decision-making process in Bangladesh," *Journal of Health, Population & Nutrition,* vol. 31, no. 2, pp. 211-7, 2013. | Yes | Yes | Yes | Yes | Yes | No | 75 |
| L. J. Nyirenda, K. I. Sandberg, and J. Justice, "When are health systems ready for new vaccines? the introduction of pneumococcal vaccine in Malawi," Forum for Development Studies, Article vol. 41, no. 2, pp. 317-336, 2014. | Yes | Yes | Yes | Cannot tell  No information on data collection and limited information on data analysis | Yes | No | 50 |
| S. Ozawa et al., "Evidence-to-policy gap on hepatitis A vaccine adoption in 6 countries: Literature vs. policymakers' beliefs," Vaccine, Review vol. 32, no. 32, pp. 4089-96, 2014. | Yes | Yes | Yes | Yes | Yes | Cannot tell | 75 |
| P. F. Hadisoemarto, M. R. Reich, and M. C. Castro, "Introduction of pentavalent vaccine in Indonesia: a policy analysis," *Health Policy & Planning,* vol. 31, no. 8, pp. 1079-88, 2016. | Yes | Yes | Yes | Yes | Yes | No | 75 |
| A. Parrella *et al.*, "Prioritizing government funding of adolescent vaccinations: Recommendations from young people on a citizens' jury," *Vaccine,* Article vol. 34, no. 31, pp. 3592-3597, 2016. | Yes | Yes | No   * Study participants were recruited by a market research company with expertise in conducting health research, with the aim of recruiting 20 jurors * Authors did not sample considering ethnicity, which could potentially have resulted in a more diverse range of opinions. | Yes | Cannot tell | Yes | 50 |
| S. Pooripussarakul, A. Riewpaiboon, D. Bishai, C. Muangchana, and S. Tantivess, "What criteria do decision makers in Thailand use to set priorities for vaccine introduction?," *BMC Public Health,* Article vol. 16, no. 1, 2016, Art. no. 684. | Yes | Yes | Yes | Cannot tell  No information provided on the data analysis as this is data that feed into the logistic regression | Yes | No | 50 |
| I. Romore *et al.*, "Policy analysis for deciding on a malaria vaccine RTS,S in Tanzania," *Malaria Journal,* vol. 15, p. 143, 2016. | Yes | Yes | Yes | Yes | Yes | No | 75 |
| A. Caro Martinez et al., "Adoption of the HPV vaccine: A case study of three emerging countries," Journal of Comparative Effectiveness Research, vol. 6, no. 3, pp. 195-204, May 2017 | Yes | Yes | Yes | Yes | Yes | No | 75 |
| L. Wallace and L. Kapirir, "How Are New Vaccines Prioritized in Low-Income Countries? A Case Study of Human Papilloma Virus Vaccine and Pneumococcal Conjugate Vaccine in Uganda," International Journal of Health Policy & Management, vol. 6, no. 12, pp. 707-720, 2017 | Yes | Yes | Yes | Yes | Yes | No | 75 |
| N. Howard, H. Walls, S. Bell, and S. Mounier-Jack, "The role of National Immunisation Technical Advisory Groups (NITAGs) in strengthening national vaccine decision-making: A comparative case study of Armenia, Ghana, Indonesia, Nigeria, Senegal and Uganda," Vaccine, vol. 36, no. 37, pp. 5536-5543, 2018 | Yes | Yes | Yes | Yes | Yes | No | 75 |
| G. St-Martin, A. Lindstrand, S. Sandbu, and T. K. Fischer, "Selection and Interpretation of Scientific Evidence in Preparation for Policy Decisions: A Case Study Regarding Introduction of Rotavirus Vaccine Into National Immunization Programs in Sweden, Norway, Finland, and Denmark," Frontiers in Public Health, vol. 6, p. 131, 2018 | Yes | Yes | Yes | Yes | Yes | No | 75 |
| R. Chen and E. Wong, "The feasibility of universal HPV vaccination program in Shenzhen of China: a health policy analysis," BMC Public Health, vol. 19, no. 1, p. 781, 2019 | Yes | Yes | Yes | Yes | Yes | Cannot tell | 75 |
| I. M. van der Putten, A. T. G. Paulus, M. Hiligsmann, R. C. W. Hutubessy, and S. Evers, "Evidence-informed vaccine decision making: The introduction of Human Papilloma Virus (HPV) vaccination in the Netherlands," Health Policy, Research Support, Non-U.S. Gov't vol. 123, no. 3, pp. 260-266, 2019 | Yes | Yes | Yes | Yes | Yes | Yes | 100 |

* **3 articles using mixed methods**

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| **Article** | **Screening questions (ALL STUDY TYPES): Methodological quality criteria** | | **Type of study: Mixed methods** | | | **Type of study: Quantitative (descriptive)** | | | | **Type of study: Qualitative** | | | | **Total (%)** |
|  | Are there clear qualitative and quantitative research questions (or objectives), or a clear mixed methods question (or objective)? | Do collected data address the research question (objective)? | Is the mixed methods research design relevant to address the qualitative and quantitative research questions (or objectives), or the qualitative and quantitative aspects of the mixed methods question (or objective)? | Is the integration of qualitative and quantitative data (or results\*) relevant to address the research question (objective)? | Is appropriate consideration given to the limitations associated with this integration, e.g., the divergence of qualitative and quantitative data (or results\*) in a triangulation design? | Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed methods question)? | Is the sample representative of the population under study? | Are measurements appropriate (clear origin, or validity known, or standard instrument)? | Is there an acceptable response rate (60% or above)? | Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question (objective)? | Is the process for analyzing qualitative data relevant to address the research question (objective)? | Is appropriate consideration given to how findings relate to the context, e.g., the setting, in which the data were collected? | Is appropriate consideration given to how findings relate to researchers’ influence, e.g., through their interactions with participants? |  |
| N. Nguyen Quy et al., "Human papillomavirus vaccine introduction in Vietnam: formative research findings," Sexual Health, vol. 7, no. 3, pp. 262-270, 2010. | Yes | Yes | Yes | Yes | No | No  Sample size is not provided | Yes | Cannot tell  No information on the questions asked | Cannot tell | No  No information on the selection of participants | Yes | Yes | No | 25 |
| B. Piso, I. Zechmeister, and S. Geiger-Gritsch, "Criteria for vaccine introduction: Results of a DELPHI discussion among international immunisation experts on a stepwise decision-making procedure," Journal of Public Health, vol. 19, no. 1, pp. 73-80, February 2011. | Yes | Yes | Cannot tell  Methods section is not clear | Cannot tell | No | No  Convenient sample  We invited 40 international immunization experts in 16 industrialized countries whom we had identified by contacting international HTA agencies to participate in a DELPHI discussion | Cannot tell | Yes | No  14/60=0.23 | Yes | No  A questionnaire was distributed; data was analyzed in Excel and SPSS, but reported as qualitative data. | No | No | 25 |
| I. M. Van Der Putten, S. M. A. A. Evers, R. Deogaonkar, M. Jit, and R. C. W. Hutubessy, "Stakeholders' perception on including broader economic impact of vaccines in economic evaluations in low and middle income countries: A mixed methods study," BMC Public Health, Article vol. 15, no. 1, 2015, Art. no. 356. | Yes | Yes | Yes | Yes | Yes | No | No  The NUVI participants are actively involved in vaccine advocacy at a global as well as country level. Results reflect viewpoints from stakeholders in favor of promoting the wider benefits of vaccines. | Yes | No | Yes | Yes | Yes | Cannot tell | 25 |