

# Protocol for a Living Evidence Repository and Gap Map on Human Papillomavirus Vaccines Delivery

Version 3.0

## Protocol information

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# Background and Objectives

Despite the proven efficacy of the human papillomavirus (HPV) vaccines in preventing cervical and other cancers, global coverage remains suboptimal. Challenges in HPV vaccine delivery, accessibility, effectiveness, feasibility, equity and vaccine hesitancy persist across various regions, especially in low- and middle-income countries (LMICs) (1,2). This protocol for the repository of evidence on HPV vaccine delivery is developed collaboratively to reflect the priorities of the HPV Living Evidence Partnership community ([HPV Living Evidence Partnership](#)). The repository will be continually updated. Based on current funding, we anticipate that the last update will be in early 2027.

## Goal

To provide a comprehensive evidence repository and maps that identify available evidence and implementation gaps on HPV vaccine delivery in LMICs, with the goal of informing policy change and guiding strategic decision-making.

## Objectives

1. Identify and describe evidence on HPV vaccine delivery (not screening or disease burden), and evidence that informs planning, implementation, and coordination.
2. Highlight gaps in research and practice to guide future studies and interventions.
3. Support policymakers, public health practitioners, and researchers with an organized repository of evidence.

## Scope

### Thematic focus

This protocol focuses exclusively on evidence related to the delivery of HPV vaccination in LMICs. Thematic areas include:

- Delivery strategies (e.g., school-based, outreach, facility-based)
- Health systems readiness, training and infrastructure
- Demand generation and communication
- Monitoring and data systems for HPV vaccine delivery
- Coordination and implementation structures
- Equity and gender within delivery contexts, including barriers to delivery to for example adolescent girls or marginalized groups
- Vaccine choice

## Geographical focus

LMICs

## Inclusion and Exclusion Criteria

### Study types

#### **Inclusion**

All empirical study designs are eligible. This includes, but is not limited to:

- Surveys/cross sectional studies
- Case studies
- Systematic reviews
- Narrative reviews
- Review of reviews
- Evidence maps
- Cohort studies
- Qualitative studies
- Modeling studies
- Impact evaluations
- Costing studies
- Randomised trials
- Pre-post studies
- Implementation research

#### **Exclusion**

- Opinion pieces without empirical data (e.g., editorials)

### Publication status

#### **Inclusion**

- Peer-reviewed journal articles
- Preprints
- Government reports
- NGO or donor reports
- Technical briefs
- Theses/dissertations
- Unpublished data/evaluations

## Exclusion

- Press releases
- Abstracts
- On-going studies

## Topics

### Inclusion

- Delivery strategies (e.g., school-based, outreach, facility-based)
- Health systems readiness, training and infrastructure
- Demand generation and communication
- Monitoring and data systems for HPV vaccine delivery
- Coordination and implementation structures
- Equity and gender within delivery contexts, including barriers to delivery to for example adolescent girls or marginalized groups
- Vaccine choice, including efficacy, safety

### Exclusion

- Studies focusing only on disease burden or HPV prevalence/incidence data
- Studies solely focused on screening or treatment of cervical cancer

## Participants

### Inclusion

- Girls - all ages
- Boys - all ages
- Parents
- Healthcare workers
- Interest holders

### Exclusion

- None

## Geographical scope

### Inclusion

- LMICs based on the World Bank's fiscal year 2025 (data for calendar year 2023) [World Bank Country and Lending Groups – World Bank Data Help Desk](#). We also include Venezuela even though it is currently unclassified by the World Bank.

- Mix of low, middle and high income countries

#### **Exclusion**

- High income country only

## Language

#### **Inclusion**

- English
- French

#### **Exclusion**

- Languages other than English or French

## Methodology

### Search strategy

We will search the following databases: Google Scholar, iris.who.int, globalindexmedicus.net, OpenAlex, PubMed, DOAJ, Crossref, Cochrane, 3ie, Basenet, Research for life, Research square, Taylor & Francis online, GAVI, PATH, UNICEF, WHO.int, Google.com, Europe PMC and we will reach out to the community for additional references not identified by the database searches.

#### **Search strings in English**

1. (((HPV[ti] OR Papilloma\*[ti]) AND (vaccine\*[ti] OR vaccinat\*[ti] OR immuniz\*[ti] OR immunis\*[ti])) OR ((gardasil[ti] OR cervarix[ti])) OR ("Papillomavirus Vaccines"[Mesh])) AND ((deliver\*[tiab] OR system\*[tiab] OR roll\*[tiab] OR implement\*[tiab] OR polic\*[tiab] OR program\*[tiab])))
2. (HPV vaccine OR Human Papillomavirus vaccine OR cervical cancer vaccine) AND (delivery OR planning OR implementation OR coordination OR rollout OR campaign) NOT (cancer screening OR disease burden OR vaccine choice)
3. human papillomavirus vaccine filetype:pdf
4. HPV Vaccine

#### **Search strings in French**

1. (Vaccin contre le HPV OR Vaccin contre le VPH OR vaccin contre le virus du papillome humain OR vaccin contre le cancer du col de l'utérus) AND (livraison OR planification

OR mise en œuvre OR coordination OR déploiement OR campagne) NOT (dépistage du cancer OR fardeau de la maladie OR choix vaccinal)

2. "Vaccination contre le VPH" OR "Vaccin contre le VPH"
3. VACCIN VPH filetype:pdf

The third set of searches will cover the period from January, 2000 to May, 2026.

## Screening

We will do an Initial screening by title/abstract, eligible references will then be screening based on the full text. Differences in screening will be reconciled and decisions made by a third reviewer where required. Percentage agreement and/or interrater reliability will be reported for the screened records.

### Initial screening by title/abstract

References identified through the search will be imported into EPPI-Reviewer, a web based software program for managing and analysing data in all types of systematic reviews (3). Duplicate records will be automatically identified through the built in deduplication algorithm to ensure only unique references proceed to the screening stage. References with missing abstracts will be identified and abstracts will be found and added manually where available.

A subset of references (~10%) will be double screened by two human reviewers to ensure consistency in the screening criteria and guidance and also to serve as a “ground truth” dataset to train the Large Language Models (LLMs) .

The references which have been marked as an include by the human reviewers will be screened on title and abstract using the LLM prompt from v1 of the map to further determine how accurate the recall and precision of the prompt is. Using the human decisions and feedback from the LLM model the prompt will be iteratively refined to optimize recall, so that the chance of missing relevant studies is minimized, and then the precision to reduce the workload for the human reviewers. The prompt will take the format of:

*“(GPT-4.1): is\_this\_record\_about\_HP\_V\_vaccines: boolean // [does this record report a study about HPV vaccines?]”.*

A random (10%) subset of references screened using the LLM will then be checked by the team lead to ensure the accuracy of the LLM results. All included references by the human reviewers and the LLM will then be screened at the full text level.

### Full-text screening

We will retrieve full texts for references included at title/abstract level from the Zotero plugin to the EPPI-Reviewer software, any full texts not found will be searched for and added manually.

Full text will be screened by one reviewer with a percentage check in (~10%) by a second reviewer. Any disagreement will be solved by discussion or if needed by involving a third reviewer. Automation will not be used for full text screening and references included at the full text screening will progress to data extraction.

## Data extraction

We will extract data using LLMs from the included full text documents according to the HPV vaccine delivery taxonomy v2. Using the definition, scope notes and if needed additional clarifying information, a prompt is constructed to ensure accurate information is retrieved from the fulltext document in order to classify or extract specific text relevant to this term. These prompts are developed individually and are specific to each term. For a list of the taxonomy scheme and concept please see [appendix 1](#) for a full description please see the [Taxonomy Reader](#).

## Analysis

The data is stored in the [Living HPV Vaccine Delivery Evidence Repository](#).

The records can be filtered by the items in the [HPV Vaccine Delivery Taxonomy](#) developed for this project. The records can be visualised as an interactive map - users can create matrices mapping one variable with another for example: thematic focus vs World Bank region. Finally, groups of records can be summarised using AI. This feature is currently not available to the public as it undergoes testing with a small group of pre-registered users.

We will continue to incorporate new records into the repository. The planned cadence is currently monthly. Based on current funding, we anticipate that the last update will be in early 2027.

## Engagement and reporting

The primary users of this repository and maps will be decision-makers and primarily their advisors in LMICs involved in HPV vaccine delivery, including but not limited to: representatives from National Immunisation Technical Advisory Groups (NITAGs), EPI teams, Ministries of Health, Ministries of Education, Ministries of Finance, technical partners, academia, researchers, implementing partners, and civil society.

The Future Evidence Foundation, the partnership secretariat will facilitate and convene a community of users to engage with, support the dissemination of, and directly use evidence stored in this repository. This community and engagement process will focus on collectively refining a rigorous body of evidence to ensure that policy and practice questions receive timely, context-specific answers.

The community will be engaged through three structures:

- The Steering Group (SG) stewards the development of the living HPV vaccine delivery evidence base. It provides strategic direction and ensures that the living evidence serves the broader research and delivery community and meets end users' needs. See here for the involved individuals.
- The Tactical Group (TG) provides expert guidance and technical oversight to the eBASE Africa team, UCL, and Alive, which are the teams responsible for developing the repository and maps. Members of the TG will provide technical oversight to ensure the LSR is both methodologically sound and meets the needs of decision-makers. The TG will provide technical oversight to ensure the development of robust, high-quality living protocols.
- The Group of Advisors (AG) provides technical input and systems insight to inform the SG's strategic decisions.

The repository will be regularly updated. Based on current funding we anticipate that the last update will be in early 2027.

## Change log

Version	Change
3.0	Bibliographic records of research articles and grey literature in English and French published between 1st January 2000 - 1st May 2026.
3.0	Updated filter tags/keywords list based on revised and expanded underlying taxonomy. Further details are available in the <a href="#">Version 2.0 Taxonomy</a> and <a href="#">Version 2.0 Taxonomy Change Report</a>
3.0	New user interface and visual design
3.0	New boolean and faceted search functionality
3.0	New workflow and functional improvements
3.0	New AI-supported evidence summary tool. <i>Please note we are currently running a limited, gated preview with a small group of pre-registered testers to help us refine the tool. While spots are limited, we hope to expand access over time. If you are interested in joining future testing phases, please contact <a href="mailto:hello@aliveevidence.org">hello@aliveevidence.org</a></i>
2.0	French language added as inclusion criteria
2.0	Search strategy updated
2.0	WHO and UNICEF regions added under data extraction

## References

1. Aggarwal S, Agarwal P, Gupta N. A comprehensive narrative review of challenges and facilitators in the implementation of various HPV vaccination program worldwide. *Cancer Med.* 2024 Feb;13(3):e6862. doi: 10.1002/cam4.6862. Epub 2024 Jan 11. PMID: 38213086; PMCID: PMC10911072.
2. Rosser EN, Wysong MD, Rosen JG, Limaye RJ, Park S. HPV Vaccine Delivery Strategies to Reach Out-of-School Girls in Low- and Middle-Income Countries: A Narrative Review. *Vaccines.* 2025; 13(5):433. <https://doi.org/10.3390/vaccines13050433>
3. Thomas, J., Graziosi, S., Brunton, J., Ghouze, Z., O'Driscoll, P., & Bond, M. & Koryakina, A. (2023) EPPI-Reviewer: advanced software for systematic reviews, maps and evidence synthesis. EPPI Centre, UCL Social Research Institute, University College London

# Appendix 1

## HPV Vaccine Delivery Taxonomy

### Schemes & Concepts — Quick Reference

v2.0 | 37 schemes · 344 concepts (excl. 249 ISO country codes)

#### **Country** · Single per country

*The country in which the study took place. ISO 3166-1 alpha-3 codes.*

- 249 ISO 3166-1 alpha-3 country codes

#### **UNICEF Region** · Single

*Regional classification per UNICEF groupings.*

- East Asia and Pacific
- Eastern and Southern Africa
- Europe and Central Asia
- Latin America and Caribbean
- Middle East and North Africa
- North America
- South Asia
- West and Central Africa

#### **WHO Region** · Single

*Regional classification per WHO groupings.*

- African Region
- Eastern Mediterranean Region
- European Region
- Region of the Americas
- South-East Asia Region
- Western Pacific Region

#### **World Bank Region** · Single

*Regional classification per World Bank groupings.*

- East Asia and Pacific
- Europe and Central Asia
- Latin America and Caribbean
- Middle East and North Africa
- North America
- South Asia
- Sub-Saharan Africa

#### **Country Classification** · Single per branch (one WB + one Gavi)

*World Bank income tier and Gavi status at the time of the study.*

- **World Bank income tier**
  - Low income
  - Lower middle income

- Upper middle income
- High income
- ▶ **Gavi status**
  - Gavi-eligible
  - Gavi transitioning
  - Gavi not eligible
  - Gavi Core
  - Gavi High-impact
  - Gavi Fragile and Humanitarian
  - Gavi MICS

## Study Design · Multi

*The methodological design of the research. Use most specific child concept.*

- ▶ **Quantitative empirical**
  - Randomised controlled trial
  - Clinical trial
  - Quasi-experimental study
  - Observational study
  - Prevalence study
  - Programme evaluation or implementation research
- ▶ **Qualitative empirical**
  - In-depth and key informant interviews
  - Focus group discussion
  - Documentary analysis
  - Qualitative study
- Mixed methods
- ▶ **Modelling and economic evaluation**
  - Modelling study
    - ▶ **Economic evaluation**
      - Cost-effectiveness analysis (CEA)
      - Cost-utility analysis (CUA)
      - Cost-benefit analysis (CBA)
      - Budget impact analysis (BIA)
      - Cost analysis/costing study
- ▶ **Evidence synthesis**
  - Systematic review and meta-analysis
  - Narrative or scoping review

## Data Source · Multi

*The type of data or evidence the study drew upon. Tag all sources used.*

- Administrative and registry data
- Survey data
- KAP survey data
- Exit survey data
- Surveillance data
- Primary qualitative data
- Primary quantitative data
- Published study data
- Global modelled estimates
- Independent or evaluative study
- Costing and economic data
- Programme and policy documents

- Proficiency testing programme
- Social media and online data
- Geospatial and GIS data
- Expert elicitation data

### **Program Maturity** · Single — SINGLE-SELECT

*The lifecycle stage of the HPV vaccination programme at the time of the study.*

- Pre-introduction
- Introduction
- Routine/established

### **Program Scale** · Single — SINGLE-SELECT

*The geographic scale of the programme (not the study sample).*

- National
- Sub-national
- Pilot or demonstration

### **Outcome Measure** · Multi — 4 domains

*The outcomes measured or reported. Tag all domains that apply.*

- Delivery and Operations
- Vaccine Impact
- Economic
- Demand and Acceptability

### **Thematic Focus — Primary** · Single — MANDATORY for every record

*The single theme best reflecting the paper's primary research question.*

- Behavioural and social drivers of uptake
- Demand generation and communication strategies
- Delivery design and optimisation
- Service integration and co-delivery
- Equity and hard-to-reach populations
- Health workforce capacity and engagement
- Governance, policy and political commitment
- Financing and programme sustainability
- Measurement, data systems and enumeration
- Modelling and impact projection
- Vaccine efficacy, immunogenicity and schedule

### **Thematic Focus — Secondary** · Single — OPTIONAL

*A substantive secondary theme where the paper makes a genuine contribution beyond its primary theme.*

- Same 11 concepts as Thematic Focus — Primary
- (Cannot be the same as the Primary theme)

### **Delivery — tag when delivery is described**

### **Delivery Model Type** · Single — MANDATORY when delivery described

*The structural model of HPV vaccine delivery.*

- Single-platform
- Sequential
- Integrated/simultaneous
- Unspecified

## Delivery Platform · Multi

*The organisational mechanism through which HPV vaccination is delivered.*

- ▶ **Campaign**
  - Integrated campaign
  - Multi-age cohort catch-up campaign
  - Multiple-antigen campaign
- ▶ **Routine EPI**
  - Facility-based
  - Mobile
  - Outreach
  - Periodic Intensification of Routine Immunization (PIRI)
- School Health
- Adolescent Health
- HIV treatment platform
- National Cancer Control Programme
- Hit-and-run delivery

## Delivery Site · Multi

*The physical location where HPV vaccination is delivered.*

- School
- Facility
- Community
- Mobile unit
- Other

## Delivery Actor · Multi

*Who physically administers HPV vaccines at the point of delivery.*

- Health workers
- Community health workers
- Trained lay workers
- Private sector providers
- Other

## Vaccine Schedule · Single — SINGLE-SELECT

*The dosing schedule used or evaluated in the study.*

- Single dose
- Two dose
- Three dose
- Unspecified

## Vaccination Eligibility · Multi

*Who is eligible for vaccination as defined by the programme.*

- Age-based eligibility

- Sex-based eligibility
- Risk-based eligibility
- Routine target cohort

## Target Population · Multi

*Population groups targeted by the vaccination programme or study.*

### ▶ Age Group

- 0–8 years
- 9–14 years
- 15–20 years
- 21+ years

### ▶ Sex

- Female only
- Male only
- Female and male - gender neutral

### ▶ School enrolment

- In-school adolescents
- Out-of-school adolescents

### ▶ Special Population

- Immunocompromised populations
- Men who have sex with men
- Zero-dose/missed communities

## Setting Context · Multi

*Geographic characteristics of the study setting.*

- Urban
- Rural
- Hard-to-reach

## Fragility & Humanitarian Context · Multi

*Political and crisis context of the study setting.*

- Conflict-affected
- Post-conflict
- Displaced populations
- Humanitarian emergency

## Implementation Strategy · Multi

*How change is attempted — the implementation approach.*

- Training
- Community mobilisation
- Parent and caregiver engagement
- Social mobilisation
- Policy change

## Integration — tag when co-delivery or integration described

### Integration Type · Multi

*How HPV vaccination is integrated with other services.*

- Service co-delivery
- Bundled communication/health education
- Platform integration
- Shared funding or budget integration
- Monitoring
- Other programme integration

## Co-delivered Intervention · Multi

*The specific health services co-delivered alongside HPV vaccination.*

- Cervical cancer screening
- SRH
- HIV/AIDS care and treatment
- Other vaccines
- Deworming
- Iron/Folate supplementation
- Nutrition
- Health education
- Education
- Mental health
- GBV reduction
- NCDs
- WASH
- Vision screening
- Hearing screening
- Other

## Demand & Communication — tag when communication, demand generation, or acceptability described

### Communication Sender · Multi

*Who delivers communication or mobilisation activities.*

- Health workers
- Community health workers
- Traditional and religious leaders
- Peers
- Teachers
- Media
- Other

### Communication Recipient · Multi

*Who receives communication or mobilisation activities.*

- Adolescent girls
- Caregivers
- Fathers/male caregivers
- Community members
- Health workers
- Boys
- Other

### Communication Channel · Multi

*The medium through which communication flows.*

- Interpersonal (face-to-face)
- Mass media
- ▶ **Digital/social media**
  - Text-message reminders
- Print materials
- Other

## **Communication strategies/interventions** · Multi

*What communication approach or strategy is used.*

- Community sensitisation
- Social mobilisation
- Parent and caregiver engagement
- Reminder and recall
- Other

## **Behavioural and Social Driver** · Multi — 4 domains

*Behavioural and social factors affecting vaccine uptake. WHO BeSD framework.*

- Thinking and feeling
- Social processes
- Motivation
- Practical issues

## **Acceptability Target** · Multi

*Whose acceptability or perceptions are being assessed.*

- Recipients
- Caregivers
- Health workers
- Community leaders

## **Equity & Quality — tag when equity analysis or quality assessment present**

### **Equity Dimension** · Multi — tag only when explicitly analysed

*Dimensions of inequity explicitly analysed. PROGRESS+ framework plus HPV-specific extensions.*

- Place of residence
- Ethnicity and race
- Occupation
- Gender
- Religion
- Education status
- Socioeconomic status
- Social capital
- Age
- Disability
- Migration status
- Sexual orientation and gender identity
- Immunocompromised status
- Geographic and cross-country equity
- Disease burden and cancer incidence

## Quality of Care Dimension · Multi

*Dimensions of service quality from recipient/caregiver perspective.*

- Availability
- Accessibility
- Acceptability of services
- Safety and respect
- Continuity and referral

## Governance & Financing — tag when governance, policy, or financing addressed

### Governance Actor · Multi

*Organisations playing formal governance, coordination, or policy roles.*

- National government/Ministry
- Sub-national government
- UN partners
- Gavi/CEPI
- International NGO
- Implementing NGO
- Research institution
- Private sector
- Civil society
- Other

### Coordination Mechanism · Multi

*Formal mechanisms for leadership and coordination.*

- Interagency Coordinating Committee (ICC)
- NITAG

### Financing Mechanism · Multi

*How the vaccination programme is funded.*

- Free/fully subsidised
- User fee
- Public financing
- Donor or external financing

## Supply Chain — tag when vaccine supply or logistics addressed

### Supply Chain Aspect · Multi

*Operational dimensions of vaccine supply and distribution.*

- Procurement
- Cold chain integrity
- Cold chain maintenance
- Storage
- Distribution and transport
- Wastage management
- Stock management
- Demand forecasting

- Last-mile delivery
- Other

## Misinformation — tag when vaccine misinformation explicitly addressed

### Misinformation Activity · Multi

*Activities related to vaccine misinformation. Two sub-trees: Detection and Addressing.*

#### ▸ Detection

- Digital and social media listening
- Community and frontline feedback
- Traditional media monitoring
- Integrated misinformation reporting and response dashboards
- Behavioural and communication response interventions (indirect detection)

#### ▸ Addressing

- Communication and information correction strategies
  - Community engagement and interpersonal communication approaches
  - Social and behaviour change communication (SBCC) interventions
  - Digital communication and online response strategies
  - Traditional media and public awareness activities
  - Integrated communication or multi-component approaches
  - Curriculum integration and educational interventions
  - Legal and regulatory strategies
- Misinformation banks

## AI — tag when AI methods used or evaluated

### AI Application · Multi

*Use of AI in the research or intervention.*

- AI in data analysis or research methods
- AI in vaccination intervention or programme