The Operational Effectiveness of School Health Programs

Cross-Country Analysis

May 2026

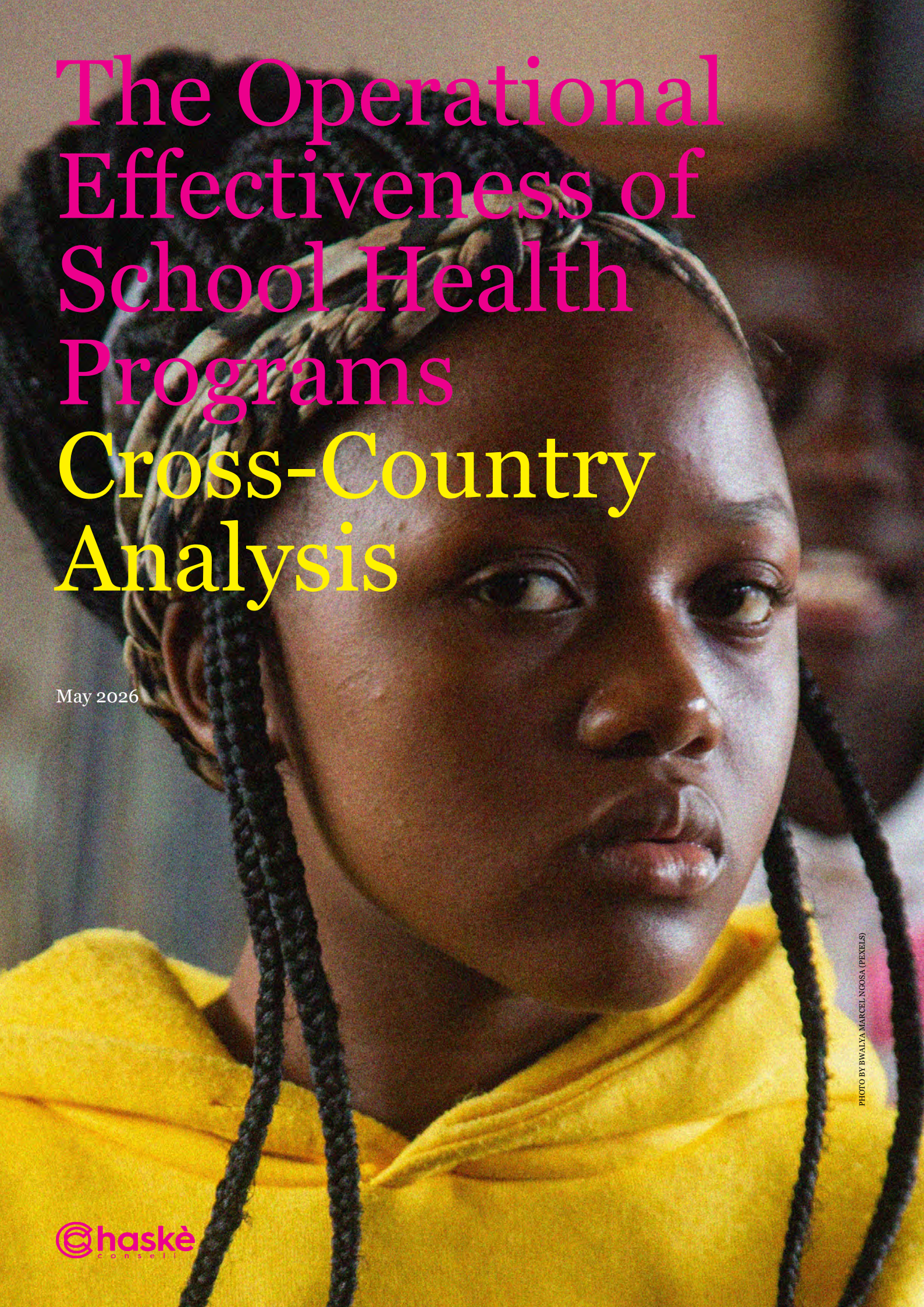


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Table of contents

Glossary of terms 3
Making school health a lasting investment in our children's future 4
Executive summary 5
Introduction 9
Country selection & context 12
Analytical dimensions 13
Governance 13
Implementation and delivery – teacher-anchored school health 20
Funding, budget flows and sustainability 25
Awareness, equity and accessibility 30
Data and performance monitoring, monitoring–evaluation–learning 34
Cross-cutting insights 39
Comparative policy dynamics and system function 40
Conclusion 45
Annex: A theory of success for School Health Programs 46
About Haskè Group 49

Glossary of terms

Term	Definition
APBD	Anggaran Pendapatan dan Belanja Daerah (Indonesia District/Subnational Budget)
BIAS	Bulan Imunisasi Anak Sekolah (Indonesia School-Based Immunization Month)
BOS	Bantuan Operasional Sekolah (Indonesia School Operational Assistance Grant)
RA-BOS	Regional/Local School Operational Assistance Grant (Subnational BOS Variant, Indonesia)
CCHP	Comprehensive Council Health Plan (Tanzania District Health Planning Instrument)
CHW	Community Health Worker
DepEd	Department of Education (Philippines)
DHIS2	District Health Information System 2
JRF	WHO/UNICEF Joint Reporting Form on Immunization
ECD	Early Childhood Development
EHCP	Essential Health Care Program (Philippines School Health Platform)
HPV	Human Papillomavirus
LGA	Local Government Authority (Tanzania)
LMICs	Low- and Middle-Income Countries
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation, and Learning
MoE	Ministry of Education
MoH	Ministry of Health
NGO	Non-Governmental Organization
OOS	Out-of-School (Adolescents/Girls)
PNSSU	Programme National de Santé Scolaire et Universitaire (Côte d'Ivoire National School Health Service)
PTA	Parent–Teacher Association
SHP	School Health Program
SSA	Sub-Saharan Africa
UKS	Usaha Kesehatan Sekolah (Indonesia National School Health Program)
WinS	Water, Sanitation and Hygiene in Schools
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
UNICEF	United Nations Children's Fund

Making school health a lasting investment in our children's future

Imagine a nine-year-old girl sitting in a classroom today. She has a future she is only beginning to imagine. Whether she gets the chance to live it should not depend on where she lives, whether she attends school, or whether a health programme happens to reach her. As the leading cause of cancer death among women in many countries of sub-Saharan Africa, cervical cancer takes the lives of around 76,000 African women every year. That is too many of us. Behind every woman lost are people who loved her, depended on her, and hoped she would recover. Yet this is a cancer we know how to prevent. Ours is the story of a gap between what we know and what we are able to deliver.

Adolescence is the moment to close that gap. Vaccinating girls against human papillomavirus (HPV) before they are exposed to the virus is highly effective. Schools are where most girls can be reached, and school health programmes bring together health workers, teachers, families and communities around the well-being of girls. School health programmes must also reach girls who are out of school, so that no girl is left behind.

The four reports in this series, produced by Haskè Conseil, examine what it takes to achieve sustainable results. A cross-country analysis of seven countries and three country studies on Tanzania, Côte d'Ivoire and Indonesia explore why similar interventions produce different results. Their central message is clear: lasting protection depends less on the intensity of campaigns than on strong institutions, with shared responsibility between health and education, predictable funding, recognised frontline staff and the trust of families and communities.

We therefore call on governments to make school health a lasting national responsibility, backed by law and by public funding that covers the everyday costs of delivery. We ask ministries of health and education to plan together, development partners to invest in national capacity beyond funding cycles, and civil society and community leaders to build the trust on which every programme depends.

We thank the Gates Foundation for its collaboration throughout the research process, and Tanzania Health Promotion Support (THPS) and Athari Advisors for supporting the research in Tanzania and Côte d'Ivoire. We also thank the government institutions, UN agencies, implementing partners and civil society organisations consulted across the three country studies.

Thirty years from now, that girl should be living the life she imagined, surrounded by the people she loves. The decisions we make today will help determine whether she gets that chance. No African woman should die of a cancer we already know how to prevent.



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Executive summary

The analysis presented in this report is guided by a system-level theory of success, which emphasizes institutionalization over episodic delivery. The cross-country findings show that sustained performance is associated with a small set of reinforcing conditions: formal governance authority between health and education sectors, clearly defined school- and teacher-level delivery roles, recurrent domestic financing for delivery functions, school-anchored planning, and government-owned data and feedback loops. Together, these conditions explain why similar technical interventions produce divergent outcomes across countries, and why short-term campaign success does not reliably translate into durable system performance. SHPs can be anchors and drivers of institutionalization. Their underlying strength contributes to predictable, equitable, and high-quality adolescent health interventions.

This report uses HPV vaccination performance as a diagnostic lens to assess the underlying functionality of school health systems across seven countries: Côte d'Ivoire, Indonesia, Jordan, Nepal, Tanzania, the Philippines and Zambia; using five core dimensions:

1. **Governance**
2. **Implementation, Delivery, and Teacher Engagement**
3. **Funding, Budget Flows, and Sustainability**
4. **Awareness, Equity, and Accessibility**
5. **Data, Performance Monitoring, and Monitoring, Evaluation, and Learning (MEL)**

A consistent systems pattern emerges across three country-categories. Category A countries (Côte d'Ivoire, Indonesia, Tanzania) display high levels of institutionalization: SHPs are legally anchored, jointly governed by ministries of health and education, embedded in routine school administration, and supported by recurrent public financing. In these systems, school-based HPV delivery is predictable, equity-adjusted, and sustained year after year. These systems consistently demonstrate higher completion rates (often >80–90% for school-delivered services in contexts with near-universal enrollment), tighter follow-up of missed cohorts, and more stable year-on-year performance. Category B countries (Philippines, Zambia) operate hybrid systems in which national policy and partial domestic financing coexist with continued donor dependence for core delivery functions, showing moderate outcomes and producing variable performance across districts. Category C countries (Jordan, Nepal) rely predominantly on projectized, externally financed delivery, where schools serve as logistical venues rather than administrative authorities—resulting in structurally fragile and episodic service provision.

SHPs emerge not merely as delivery channels, but as the core operational backbone for adolescent health services. They supply the day-to-day coordination, teacher participation, microplanning routines, reporting authority, and community trust that allow large adolescent cohorts to be reached more efficiently and repeatedly. However, countries can move across categories, as evidenced by Nepal. In February 2025, Nepal vaccinated 1.46 million girls (94% coverage) in a single 15-day drive, demonstrating a newfound capacity for national-scale coordination. This milestone, inaugurated by the Prime Minister, served as the catalyst for integrating HPV vaccination into the routine National Immunization Program. Nepal's 2025 nationwide MAC campaign demonstrates that high coverage can still be achieved when political leadership, school access, and partner support align at a national scale.

Table 1: Institutional Maturity of School Health Programs by Country Category

Category countries	Governance model	Delivery	Financing	Key constraints
Category A: Tanzania, Indonesia, Côte d'Ivoire	State-led and Legally Anchored: Formal health/ education coordination.	Routine Public Service: Varies from decentralized microplanning to centralized public delivery.	Domestic: Embedded in public health/education budgets.	Subnational performance variations; ongoing system consolidation.
Category B: Philippines, Zambia	Hybrid: Formal policies exist, but operational authority is uneven.	Project-based delivery (e.g., transitional campaigns).	Mixed: Partial domestic combined with donor support.	Fiscal volatility; heavy reliance on donor funding; uneven district execution.
Category C: Nepal, Jordan	Campaign-Driven: Policy commitment, but lacks embedded school-level authority.	Outside Routine Systems: Project-based delivery (e.g., transitional campaigns).	External: Predominantly time-bound donor financing.	Structural fragility; unsustainable coverage; frequent service interruptions.

COMPARATIVE SYSTEM PATTERNS ACROSS CATEGORIES

Across all seven countries, governance emerges as the most influential upstream determinant of system performance. When inter-ministerial coordination is formalized through joint decrees, codified school roles, and shared reporting systems, implementation at the district and school level becomes administratively smoother, meaning processes such as scheduling, consent management, and reporting follow standardized routines with fewer delays or ad hoc negotiations. It also becomes financially more predictable, as budgets are embedded in annual plans rather than dependent on emergency donor disbursements. Operational resilience refers to the system's ability to maintain service delivery despite disruptions such as staff turnover, transport delays, or funding fluctuations, because roles, resources, and accountability are institutionalized rather than improvised.

In contrast, where coordination remains informal, implementation is partner-mediated, meaning operational authority, financing, supervision, and even data systems are temporarily substituted by donors or NGOs rather than embedded within routine public administration. This creates fragility: delivery depends on external timelines and funding cycles, making continuity and equity harder to sustain.

FINDINGS ACROSS THE FIVE DIMENSIONS

1. Governance. Countries with legally anchored SHPs tend to outperform others because roles are formalized, responsibilities are shared across sectors, and coordination is institutional rather than project-based. Indonesia, Tanzania, and Côte d'Ivoire all illustrate forms of institutionalized state ownership, but through different governance architectures. In Indonesia, the UKS framework embeds school health within a formal inter-sectoral structure linking health and

education. Tanzania similarly relies on inter-sectoral school health committees and decentralized coordination mechanisms that connect national policy to district-level implementation. Côte d'Ivoire represents a more centralized administrative model: through PNSSU-SAJ, school health is organized as a dedicated public service under the Ministry of Health, coordinated intersectorally with education, and delivered through specialized school health services nationwide. Although these models differ in form, all three demonstrate operational authority beyond policy intent alone. By contrast, Nepal and Jordan reflect policy commitment without equivalent authority or routinized implementation at the school level, suggesting that governance effectiveness depends not only on policy adoption, but on whether coordination, mandate, and delivery authority are institutionally embedded.

2. Implementation, Delivery, and Teacher Engagement. Effective delivery depends on routine district microplanning, predictable school–facility collaboration, and clearly-defined, institutionalized teacher roles that cover accurate class-by-age lists, consent and household communication, and orderly delivery-day management. Tanzania's district-led planning cycle displays high operational coherence; Indonesia maintains robust national structures with provincial variability. The Philippines and Zambia rely on mixed public–donor execution with limited school-side authority to trigger revisits. Nepal has an established school health policy framework, but HPV introduction has historically been driven mainly through the immunization program and campaign-style delivery, with the 2025 rollout marking a transition toward routine integration. Jordan has school health services, but there is currently no national HPV vaccination program integrated into them

.3. Funding, Budget Flows, and Sustainability. Domestic financing is the strongest predictor of long-run stability, which we define as the ability to maintain school health delivery at consistent coverage levels across multiple years without reliance on short-term donor cycles or emergency funding. Systems in Category A achieve this by embedding SHP costs into education and health budgets or public payrolls, ensuring predictable annual allocations and institutional continuity. In contrast, Category B operates hybrid models where partial domestic financing coexists with donor support, creating fiscal volatility and uneven performance across districts. Category C remains structurally fragile because it depends almost entirely on time-bound donor financing, leaving programs vulnerable to funding shocks and unable to guarantee sustained service delivery. In essence, stability means routine, budgeted delivery that persists beyond project timelines, enabling schools and districts to plan confidently and avoid service interruptions.

4. Awareness, Equity, and Accessibility. Institutional SHPs in Category A double as trusted communication and access platforms, yielding more even population coverage and fewer geographic gaps. Equity in Category B is uneven and fiscally mediated. In Category C, awareness and access is reliant on the NGO footprint rather than being based on what the population needs.

5. Data, Performance Monitoring, and MEL. Routine monitoring is strongest where schools and facilities exchange data through standardized reporting channels. Tanzania demonstrates continuous feedback loops; Indonesia shows strong national architecture with provincial disparities; Côte d'Ivoire is upgrading. Categories B and C rely more on parallel partner M&E platforms with limited institutional ownership.

Table 2: Cross-Cutting Findings Across Five Institutional Dimensions

Dimension	**Category A (Institutionalized)**	**Category B (Hybrid)**	**Category C**
Governance	Legally anchored; strong intersectoral coordination; state-embedded authority.	Policy exists, but coordination and operational authority are only partially institutionalized.	Policy intent exists, but lacks embedded mandate or delivery authority.
Implementation and Delivery	Routine planning cycles; predictable facility collaboration; explicit teacher roles.	Mixed execution with donor reliance; limited school authority for follow-up.	Delivered via campaigns/ vertical programs; school-level routinization lacking or limited.
Funding and Sustainability	Integrated domestic financing (health/education budgets); multi-year continuity.	Hybrid financing leading to fiscal volatility and uneven implementation.	Heavy reliance on time-bound donor funding; highly vulnerable to shocks.
Equity and Accessibility	Schools serve as trusted platforms; broader, more even population coverage.	Equity and access vary significantly by district and funding availability.	Access follows NGO/ project footprints rather than actual population needs.
Data and Monitoring	Routine school-facility data exchange; established institutional feedback loops.	Mixed reliance on partner M&E systems alongside government reporting.	Parallel, partner-led M&E platforms with minimal institutional ownership.

OVERALL SYNTHESIS

Across all seven countries and five dimensions, the comparative evidence demonstrates that SHPs are a primary structural determinant of reliable, equitable adolescent and HPV service delivery – alongside school enrollment, political commitment, and broader health system capacity. HPV performance, therefore, reflects not an isolated immunization challenge, but a broader indicator of institutional strength across governance, financing, data integration, teacher engagement, and district execution capacity. In sum, the data show that routine adolescent service delivery emerges only where school health is legally anchored, domestically financed at the delivery level, operationally owned by schools and districts, and informationally integrated with health systems. Where any of these pillars are absent, delivery remains inherently fragile, regardless of national policy commitments or short-term coverage gains.

Introduction

Across Lower- and Middle-Income Countries (LMICs), the school platform has become central to adolescent health due to intersecting demographic, educational, and health system trends.[1,2] Globally, there are 1.2 billion adolescents, and sub-Saharan Africa alone is projected to experience a 40% increase in its adolescent population by 2030.[3,4] With 70–85% of 10–14-year-olds enrolled in school in most LMICs, the education system now provides the most consistent channel for delivering preventive care – often more accessible than health facilities, particularly in rural areas where Community-Health Worker (CHW) density can drop below 5 per 10,000 population.[5,6]

Rapid expansion in lower-secondary education – 15–25 percentage-point gains over the past decade – has reinforced the case for routing adolescent health interventions through schools.[7] At the same time, global commitments such as the cervical cancer elimination initiative (endorsed by 110+ countries) have renewed interest in integrating effective adolescent services into School Health Programs (SHPs).[8,9] SHPs are increasingly recognized as a core platform for delivering essential services to adolescents in LMICs. This age group faces a unique combination of developmental, behavioral, and social risks – yet remains under served by conventional health systems. Adolescents seek care less frequently, often have limited autonomy in health decision-making, and are exposed to misinformation and stigma around sensitive topics such as sexual and reproductive health.

Despite these needs, fewer than 30% of LMICs have a structured SHP, and even fewer maintain routine delivery systems for preventive services targeting adolescents.[10] Persistent structural constraints limit the capacity of SHPs. Ministry of Health (MoH)–Ministry of Education (MoE) coordination is often informal; data systems focus on infant cohorts rather than class-based adolescent tracking; and teacher engagement – one of the strongest operational determinants of successful school-based delivery – remains weakly institutionalized.[11,12,13] Geography further complicates service delivery in island nations, pastoral zones, and dense informal settlements.[14,15]

In this context, HPV vaccination provides a diagnostic lens for examining the functionality and maturity of school health systems.[16] Delivery of HPV vaccines requires reaching a narrowly defined cohort (ages 9–14), ensuring access to schools, coordinating between ministries, managing sensitive communication, and engaging parents, teachers, and community leaders. These requirements closely mirror the operational demands of broader school health interventions.[17,18]

1 UNICEF. Adolescent Development and Participation.
2 WHO. Adolescent Health: Key Facts.
3 UNICEF. Generation 2030 Africa 2.0: Prioritizing investments in children to reap the demographic dividend.
4 Vision of Humanity. Navigating the effects of a rising youth population in Africa.
5 UNESCO Institute for Statistics. Global Education Monitoring Report: Lower Secondary Completion Trends.
6 WHO Global Health Observatory. Community Health Worker density (per 10,000 population).
7 World Bank / UNESCO UIS. Tracing Global Trends in Education.
8 WHO. Global Strategy to Accelerate the Elimination of Cervical Cancer as a Public Health Problem (2020).
9 WHO. Cervical Cancer Elimination Initiative (2025 update).
10 UNESCO, UNICEF, WFP, WHO. Ready to Learn and Thrive: School health and nutrition around the world (2023).
11 WHO & UNESCO. Making Every School a Health-Promoting School: Implementation Guidance (2021).
12 Harte, P., & Barry, M. M. (2024). Scoping review of school-based mental health promotion and prevention interventions in LMICs. Cambridge Prisms: Global Mental Health.
13 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.
14 Gammino, V. M., et al. (2020). Health services uptake among nomadic pastoralist populations in Africa: A systematic review. PLOS Neglected Tropical Diseases.
15 Mor, S. M., et al. (2024). Community-designed One Health units as a model for integrated service delivery in pastoralist areas of Africa. One Health Cases.
16 Felsher, M., et al. (2024). A systematic literature review of HPV vaccination strategies within national and regional immunization programs. Human Vaccines & Immunotherapeutics.
17 Ibid.
18 Thilly, N., et al. (2024). Effectiveness of a school- and primary care–based HPV vaccination intervention (PrevHPV trial). JAMA Network Open.

As such, HPV serves as a system stress test revealing the underlying capabilities of SHPs.[19,20] Performance in HPV delivery therefore, indirectly reflects the strength of key components of school health systems, including:

- Clarity and authority of SHP governance[21,22]
- Effectiveness of MoH–MoE operational collaboration[23]
- Institutionalization of teacher roles and engagement frameworks[24]
- District-level planning, microplanning accuracy, and enumeration systems[25,26]
- Data flow and interoperability between sectors[27]
- Equitable reach of school-based services, especially for marginalized adolescents[28,29]

OBJECTIVES OF THE STUDY

This report uses HPV vaccination as an analytical entry point to understand the broader determinants of SHP performance. The objectives are to:

- **Compare governance, financing, delivery models, and operational capacity** across SHPs with differing levels of maturity.
- **Assess how SHP structures facilitate or hinder the delivery** of adolescent preventive services, using HPV as a reference case.
- **Identify systemic enablers and bottlenecks** that shape coverage, equity, sustainability, and quality of data within school health platforms.
- **Generate transferable lessons** to inform national policy, partner investments, and long-term strengthening of SHPs.
- **Highlight evidence gaps**, especially around sustainability, institutionalization, and integration of adolescent services within school routines.

SCOPE AND LIMITATIONS

The study assesses five analytical dimensions that shape the functionality, reach, and sustainability of SHPs. Countries were grouped by system maturity to enable comparative analysis:

Category A: institutionalized SHPs (Côte d'Ivoire, Indonesia, Tanzania)[30]
Category B: emerging or inconsistent SHPs (Philippines, Zambia)
Category C: limited or fragmented SHPs (Jordan, Nepal)

The analysis draws on national SHP and immunization policies, operational manuals, routine administrative data, and partner and government documentation from 2020–2025. In the three Category A countries, the desk review was complemented by stakeholder interviews with national program managers, subnational officials, implementing partners, and education-sector representatives. These interviews provide critical contextual detail, especially regarding governance practices, cross-sector coordination, school-level routines, and emerging bottlenecks

19 Rosen, J. G., et al. (2023). Feasibility and sustainability of a school-based platform for integrated HPV vaccination with adolescent services in Tanzania. Health Policy and Planning.
20 Ibid.
21 WHO & UNESCO. Making Every School a Health-Promoting School: Implementation Guidance (2021).
22 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.
23 WHO & UNESCO. Making Every School a Health-Promoting School: Implementation Guidance (2021).
24 Harte, P., & Barry, M. M. (2024). Scoping review of school-based mental health promotion and prevention interventions in LMICs. Cambridge Prisms: Global Mental Health.
25 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.
26 Thilly, N., et al. (2024). Effectiveness of a school- and primary care–based HPV vaccination intervention (PrevHPV trial). JAMA Network Open.
27 WHO & UNESCO. Making Every School a Health-Promoting School: Implementation Guidance (2021).
28 UNESCO, UNICEF, WFP, WHO. Ready to Learn and Thrive: School health and nutrition around the world (2023).
29 Gammino, V. M., et al. (2020). Health services uptake among nomadic pastoralist populations in Africa: A systematic review. PLOS Neglected Tropical Diseases.
30 Internal categorization details are consistent with regional SHP typologies derived from comparative qualitative studies (e.g., Rosen et al. 2023)

that may not be visible in formal documentation.[31] A particular focus is placed on decentralization, given its strong influence on planning accuracy, budget flows, teacher involvement, and variance in school-level execution.[32,33]

However, several limitations affect the analysis. Data completeness and reliability vary widely across settings, with gaps in school-level reporting and inconsistent documentation of teacher incentives, community mobilization practices, and microplanning quality.[34] Significant subnational variation – especially in large or highly decentralized countries – also complicates cross-country comparisons.[35] In several contexts, SHP and HPV strategies remain in transition, limiting the ability to assess long-term sustainability. These constraints are mitigated through triangulation across sources and careful attention to local institutional and operational realities.[36]

Where footnotes reference national program documentation, operational guidelines and partner briefing materials, these were obtained during country visits and stakeholder consultations and are not publicly available. Figures drawn from these sources and from interviews are reported as program estimates rather than published statistics.

31 Gammino, V. M., et al. (2020). Health services uptake among nomadic pastoralist populations in Africa: A systematic review. PLOS Neglected Tropical Diseases.
32 Ibid.
33 Methodological emphasis on decentralization reflects frameworks used in Rosen et al. (2023) and Kotromanović Šimić et al. (2024)
34 Schultz & Ruel-Bergeron. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.
35 Gammino, V. M., et al. (2020) and multiple field assessments on decentralized systems identify subnational variance limitations
36 Schultz & Ruel-Bergeron. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.

Country selection and context

The countries included in this analysis were deliberately selected to reflect a spectrum of SHP maturity, governance arrangements, and operational capacity across low- and middle-income settings. Together, they provide a structured basis for comparing how different system configurations shape the feasibility and performance of school-based HPV delivery.

Across these settings, SHP performance is shaped by a combination of structural, socio-economic, and institutional factors that condition how HPV delivery is planned and executed. Health system organization – particularly the degree of decentralization – directly affects whether planning authority, budgeting discretion, and implementation accountability sit at national, provincial, or district levels. Education system coverage and enrollment determine the effective reach of school-based delivery, especially among lower secondary learners who are the primary HPV target group.

Socio-economic conditions, geography, and cultural norms further influence access, demand, and community trust, particularly in remote rural areas, peri-urban slums, and settings with mobile or nomadic populations. Finally, prior experience with adolescent vaccination – whether through tetanus toxoid boosters, school-based deworming, or earlier HPV pilots – strongly conditions institutional readiness, microplanning quality, and community acceptance.

To anchor the comparison, the analysis draws on three deliberate contrasts:

- **Countries with institutionalized, government-funded SHPs** versus those reliant on project-based delivery.
- **Settings with high and stable school enrollment** versus those with significant dropout or transition losses.
- **Systems with prior adolescent vaccination experience** versus those introducing HPV without precedent.

The purpose of this comparative design is to surface how governance maturity, financing architecture, and operational routines shape what is feasible at scale. By juxtaposing strong, emerging, and weak SHP environments, the section that follows is positioned to examine not only whether HPV delivery succeeds in schools, but why it succeeds or falters under different system conditions – and which elements are transferable across contexts

Analytical dimensions

GOVERNANCE

In its strongest form, school health governance establishes legal mandates, defines interministerial roles, institutionalizes coordination routines between education and health sectors, embeds school health in budget and planning cycles, and creates accountability from national to school level.[37] It determines whether preventive services for adolescents – such as deworming, nutrition, vision screening, mental health promotion, sexual and reproductive health education, and immunization – are delivered as part of a predictable routine of schooling, rather than as episodic outreach.[38]

Despite growing recognition of adolescent health, governance remains weak in most LMICs. Comparative mapping of school health and nutrition policies indicates that few LMICs have a comprehensive, legally anchored multisectoral school health policy, that interministerial budget responsibilities are rarely defined explicitly, and that donor financing carries a substantial share of school health activity in many countries.

HPV vaccination interacts with this governance architecture in especially revealing ways. Unlike health promotion or deworming, HPV vaccination requires:

- Legal authorization for medical service delivery in schools[39]
- Protection and formal tasking of teachers for mobilization and recordkeeping[40]
- High-quality coordination between immunization programs and education systems[41]
- Multi-year fiscal commitments rather than one-off campaigns[42]

Where SHP governance is institutionalized, HPV integrates into routine school health service delivery. Where governance is weak, HPV remains a vertical immunization project, vulnerable to funding gaps and political shifts.[43]

At a systems level, school health governance typically operates across four nested layers:

1. **National policy and legal mandate** (laws, joint decrees, interministerial frameworks)[44]
2. **Institutional coordination structures** (task forces, technical working groups, budget committees)[45]
3. **Decentralized authority and financing** (districts, provinces, municipalities)[46]
4. **School-level operational authority** (head teachers, school health focal points, teacher committees)[47]

Cohesion refers to the degree of alignment, continuity, and mutual reinforcement across these four layers of governance. Cohesion determines whether school health functions as a single integrated system or as disconnected pockets of activity.[48]

37 UNESCO, UNICEF, WFP, WHO. Ready to Learn and Thrive: School health and nutrition around the world (2023).
38 WHO. Adolescent Health Overview.
39 Felsher, M., et al. (2024). Systematic review of HPV vaccination strategies within national and regional immunization programs. Human Vaccines & Immunotherapeutics.
40 Harte, P., & Barry, M. M. (2024). Scoping review of school-based mental health promotion and prevention interventions in LMICs. Cambridge Prisms: Global Mental Health.
41 Ibid.
42 Rosen, J. G., et al. (2023). Feasibility and sustainability of a school-based platform for integrated HPV vaccination with adolescent services in Tanzania. Health Policy and Planning.
43 Kotromanović Šimić, I., et al. (2024). The Influence of Health Education on Vaccination Coverage and Knowledge of the School Population Related to HPV. Vaccines (MDPI).
44 UNESCO, UNICEF, WFP, WHO. Ready to Learn and Thrive: School health and nutrition around the world (2023).
45 Ibid.
46 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.
47 Harte, P., & Barry, M. M. (2024). Scoping review of school-based mental health promotion and prevention interventions in LMICs. Cambridge Prisms: Global Mental Health.
48 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.

WHAT COHESION LOOKS LIKE IN PRACTICE

- **Vertical alignment:** National joint decrees authorize schools to host vaccination sessions; district health offices use these decrees in their annual microplans; school heads receive the same mandates in their supervision guidelines.
- **Horizontal alignment:** Education and health ministries share identical roles in national guidelines, use the same calendars for planning, and exchange data through a defined reporting pathway.
- **Financial continuity:** Funds allocated at national level reach districts on schedule, and districts in turn finance school-level operations (transport, supervision, teacher briefings) without relying on emergency donor support.
- **Operational consistency:** Teachers understand their tasks because job descriptions, training materials, and reporting forms match what district health teams expect.

WHAT LACK OF COHESION LOOKS LIKE

A recurrent implementation gap is that national policy may authorize school-based vaccination without being matched by district-level preparedness, communication, and budgeted operational capacity. Where this occurs, school delivery can be delayed or uneven despite supportive national policy.

A documented implementation risk is that district planning does not always translate into effective school-level execution, particularly where teacher training, school instructions, and school–health coordination are weak. Reviews of HPV introduction in low-resource settings highlight these gaps as common constraints on sustainable delivery, rather than universal features of all programs. Ministries jointly endorse SHP, but data systems remain parallel, with schools reporting to education and health facilities reporting separately to the health sector.

In some settings, externally supported district implementation is not matched by adequate school-level support. When that happens, teacher mobilization, consent follow-up, and session planning can be uneven, increasing the likelihood that girls who are absent or missed on the first visit will need later catch-up.

Examples

- **In Tanzania, cohesion is high:** national guidelines, district Comprehensive Council Health Plans, and school-level routines all reference the same SHP mandates. Teachers, CHWs, and health facilities operate as one system.[49]
- **In Zambia, cohesion is moderate:** national policy is clear, but districts vary in whether they interpret it as an education responsibility or a health-sector outreach activity.[50]
- **In Nepal, cohesion is still currently weak:** school-based HPV delivery relies on external partners for microplanning, teacher orientation, and data tools – despite national acceptance of school delivery.[51] The 2025 campaign provided a stress test for these teacher-anchored mechanisms. The high coverage rate (94%) suggests that local school-level engagement was more effective than previous pilots indicated. Success relied on meticulous microplanning workshops and school awareness campaigns where teachers and health workers collaborated to identify eligible girls, including those out of school. This experience suggests that with standardized national guidelines, the 'weak cohesion' previously observed can be overcome during high-intensity periods, though the challenge remains to sustain this collaboration for routine annual delivery.

49 Tanzania MoH & MoE. Comprehensive Council Health Plans and School Health Guidelines (2023).
50 Zambia MoH. School Health Policy and HPV Implementation Review (2022).
51 Nepal MoH. HPV Pilot Program Evaluation Report (2021).

Implementation: "Grafting" onto Existing Routines (HPV-Plus)

Rather than creating standalone 'vaccination days,' countries can accelerate progress by 'grafting' HPV vaccination onto existing, trusted school platforms, such as deworming weeks or nutrition check-ups.

This 'HPV-Plus' model—as seen in programs like Tanzania's integration of vaccination with nutritional assessments—leverages the community trust and logistics already established for other routine school health interventions. By using HPV as an entry point to strengthen the broader school health platform, the system achieves higher equity and better sustainability compared to isolated vertical campaigns.

In rural districts of Tanzania, over 80% of primary school annual calendars already include deworming weeks, vision screening days, and nutrition monitoring.[52] When HPV was introduced nationally, it did not require the creation of a new delivery architecture. Instead, it was inserted into existing school health routines; district education offices issued school-level instructions, health facilities assigned outreach teams, teachers mobilized students and parents, and local governments tracked coverage as part of routine performance reviews.[53] The vaccine did not create the system; it revealed a system that already existed.

In contrast, in countries where school health lacks a formal mandate, HPV teams often begin by mapping schools from scratch, negotiating access with head teachers each year, and operating through temporary permissions rather than institutional authority. The difference is not technical capacity – it is governance.[54]

Category A: Fully institutionalized school health governance

In Category A countries, school health programs operate as permanent public systems rather than episodic projects. Governance is legally anchored, budgeted through domestic public finance, and operationalized through clear subnational accountability.[55] As a result, HPV is delivered not as an exceptional intervention, but as a routine school health service alongside deworming, nutrition, and screening.

Indonesia operates one of the most comprehensive school health governance models globally through Usaha Kesehatan Sekolah (UKS). UKS is anchored in a national Joint Ministerial Decree involving four ministries and implemented through provincial and district governments.[56] A primary driver of Indonesia's governance success is the 'SKB 4 Menteri', a Joint Decree signed by the Ministers of Health, Education, Religion, and Home Affairs. This decree serves as a foundational legal mandate that bypasses the need for schools to negotiate individual site-level permissions. By providing top-down authorization, it ensures that school-based health activities are recognized as a core institutional duty. Research indicates that schools operating under such unified ministerial policies are significantly more likely to successfully integrate health goals with educational routines, effectively removing the bureaucratic friction that often stalls delivery in fragmented systems.

52 Tanzania MoH & MoE. Comprehensive Council Health Plans and School Health Guidelines (2023).
53 Rosen, J. G., et al. (2023). Feasibility and sustainability of a school-based platform for integrated HPV vaccination with adolescent services in Tanzania. Health Policy and Planning.
54 WHO & UNESCO. Making Every School a Health-Promoting School: Implementation Guidance (2021).
55 UNESCO, UNICEF, WFP, WHO. Ready to Learn and Thrive: School health and nutrition around the world (2023).
56 Indonesia MoH & MoE. Joint Ministerial Decree on UKS Implementation (2022).

This legal foundation translates into near-universal system coverage:

- 514 districts and cities are legally required to operate UKS units
- More than 90% of public primary schools report some UKS activity annually
- District governments finance roughly 70–80% of UKS operating costs through local budgets[57]

HPV delivery is integrated through the same BIAS school immunization platform that supports deworming, vision screening, and nutrition services. The same coordinating teams that supervise routine school health also supervise HPV. This system's integration explains how Indonesia achieved over 85% first-dose HPV coverage in multiple pilot provinces within two years, despite operating across more than 17,000 islands. Governance stability, rather than geographic simplicity, is the primary driver of performance.[58]

In Tanzania, school health governance is embedded within Local Government Authorities (LGAs), producing a deliberately shared accountability model. Formal national guidelines assign distinct but complementary roles:

- District Medical Officers provide technical authority
- District Education Officers coordinate schools
- Ward Development Committees oversee community engagement[59]

More than 185 LGAs integrate school health into annual health planning through Comprehensive Council Health Plans. Long before HPV scale-up, Tanzania had already institutionalized school-based delivery at high coverage levels, including over 90% deworming coverage and more than 75% vitamin A supplementation through schools. Because district structures already managed large-scale, school-based public health delivery, HPV was rapidly absorbed into existing governance routines rather than introduced as a temporary project.[60]

In Côte d'Ivoire, school health is governed through the Programme National de Santé Scolaire et Universitaire (PNSSU), a formal national public service with its own workforce. Unlike many low- and middle-income contexts where school health relies on borrowed facility staff, PNSSU employs dedicated school health personnel. The program operates through a dedicated network of specialized school and university health services (SSSU/CSUS) staffed by public-sector health personnel, under a statutory mandate that makes PNSSU the sole body authorized to determine which health acts may be carried out in schools, with the respective roles of the health and education ministries set out in national policy.

Because governance, staffing, and school access are structurally secured, HPV follows a continuous service-delivery logic rather than a campaign model. This sharply reduces dependence on external partners and shields delivery from routine health-facility staffing fluctuations.

Category B: Partially institutionalized and donor-dependent governance

Category B countries display strong pockets of school health activity but weak integration of biomedical services into education governance. While hygiene, nutrition, and deworming are often

57 Indonesia Ministry of Education. UKS Annual Report (2023).
58 Felsher, M., et al. (2024). Systematic review of HPV vaccination strategies within national and regional immunization programs. Human Vaccines & Immunotherapeutics.
59 Tanzania MoH. School Health Operational Guidelines (2022).
60 Mphuru, A., Li, A. J., Kyesi, F., Mwengee, W., Mazige, F., Nshunju, R., Shayo, B., Giattas, M. R., Loharikar, A., & Lyimo, D. (2022). National introduction of human papillomavirus (HPV) vaccine in Tanzania: Programmatic decision-making and implementation

institutionalized within education systems, vaccination authority remains largely external.[61] HPV therefore, depends heavily on coordination quality, political trust, and donor support.

In the Philippines, school health governance is structurally split across two sectors. The education sector leads hygiene, nutrition, and deworming through national school health and water–sanitation programs, while vaccination remains almost entirely under the health sector through facilities and outreach teams. Crucially, the Department of Education does not exercise budget authority over immunization. This separation produces several operational consequences: HPV delivery requires annual local negotiation between health and education authorities; school participation varies widely across municipalities; and following the *Dengvaxia*[62] controversy, school-based vaccine uptake fell by an estimated 30–50% in several regions. The result is a governance model where strong school health subsystems coexist with weak biomedical authority inside schools, leaving HPV particularly exposed to shifts in public trust and political coordination.[63]

In Zambia, national policy formally supports school health, but functional authority remains fragmented. Schools manage deworming and nutrition programs, while health facilities retain full control over vaccination financing and logistics. Education offices at the district level lack formal enforcement power over immunization scheduling. HPV introduction, therefore, relied heavily on donor-coordinated campaigns rather than routine school governance. As external support declines, the durability of HPV delivery within school systems remains uncertain.[64]

Category C: Fragmented or weak governance

School health functions episodically rather than systemically. Governance arrangements are institutionally thin, interministerial coordination is weak, and HPV remains peripheral to routine school operations. In Jordan, education authorities manage health promotion and basic screening, while vaccination authority is retained by the health sector with limited institutional integration. Where HPV has been piloted, delivery has followed vertical immunization campaign structures rather than school health routines[65]. Schools function primarily as physical venues rather than as governance actors with planning or accountability authority.

In Nepal, decentralization transferred authority to municipalities, but governance capacity remains highly uneven: over 40% of municipalities lack dedicated school health focal persons; budget lines for school health are frequently absorbed into general education expenditures. Although earlier HPV activity in Nepal was limited to pilot and preparatory phases, the 2025 nationwide introduction marked a major transition from subnational experience to nationally coordinated delivery. Following Gavi-supported approval and vaccine availability for a multi-age cohort (MAC) campaign, Nepal mobilized over 27,000 health workers and 54,000 volunteers nationwide, showing that with high-level political commitment and partner support, schools can function as an effective large-scale delivery platform. This transition was reinforced by subsequent integration of HPV vaccination into the routine immunization schedule.

61 Mendoza, R. U., Valenzuela, S., & Dayrit, M. M. (2020). A crisis of confidence: The case of Dengvaxia in the Philippines

62 The Dengvaxia controversy refers to the 2017 Philippines school-based dengue vaccination campaign in which later evidence showed the vaccine increased the risk of severe dengue in children without prior infection. The issue became heavily politicized, leading to public panic and a collapse in vaccine confidence, with subsequent nationwide declines in routine immunization coverage.

63 Philippine Department of Health. Post-Dengvaxia Immunization Review (2019).

64 Zambia MoH. School Health Policy and HPV Implementation Review (2022).

65 Al-Qudah, R., Al-Maharmeh, M., & Al-Sarayreh, M. (2024). From awareness to action: Unveiling knowledge, attitudes and testing strategies to enhance human papillomavirus vaccination uptake in Jordan. Vaccines, 12(3), 455.

LEGAL GOVERNANCE FRAMEWORKS, NOT JUST TECHNICAL CAPACITY, DRIVE SUSTAINED SCHOOL HEALTH PERFORMANCE

Three patterns consistently emerge across the comparison:

- **Legal mandate may matter more than technical capacity alone.** In this analysis, Category A countries are characterized by formal interministerial instruments that anchor school health within national policy, whereas Category C countries appear to rely more on less formal or less binding arrangements.
- **Dedicated public financing is the tipping point for sustainability.** In Indonesia and Tanzania, more than 70% of school health financing now flows through domestic public budgets, signaling institutionalization beyond project cycles. By contrast, in Category C countries, an estimated 60–80% of HPV-related school activity remains donor-funded, exposing programs to high volatility.
- **Schools without governance authority cannot sustain biomedical services.** Where schools lack administrative authority over service scheduling, supervision, and reporting, HPV vaccination remains externally driven and operationally fragile, rather than embedded within routine school health delivery.



PHOTO BY KIMY MOTO (PEXELS)

Table 3: Governance

Governance theme	**Strong / cohesive governance**	**Weak / fragmented governance**	**Implications for HPV delivery**
Policy and Authority (Mandates, Roles, Coordination)	Formal and Defined: Legal mandates exist; explicit interministerial roles; standing coordination committees.	Ambiguous and Ad Hoc: Relies on temporary permissions; unclear sector roles; partner-driven coordination.	Determines if HPV delivery is a routine, owned system or a high-cost, negotiated effort requiring donor microplanning.
Financing and Flow (Budget Authority, Continuity)	Embedded and Predictable: School health integrated into public budgets; funds flow on schedule.	Fragmented and Irregular: Short-term, donor-reliant financing; erratic disbursements.	Multi-year continuity requires predictable domestic funds; interruptions cause missed cohorts.
Local Operations (Decentralization, School Roles, Consistency)	Empowered and Harmonized: Districts have clear mandates; schools have operational/ planning authority; harmonized tools.	Unclear and Mismatched: Local governments lack capacity; schools are mere venues; expectations mismatch.	District readiness and active teacher engagement strongly predict HPV coverage consistency and success.
System Alignment (Vertical/Horizontal Cohesion, Delivery Mode)	Integrated and Unified: Shared calendars/data between Health and Ed; seamless alignment from national to school level.	Parallel Disconnected: Separate planning/ reporting systems; pockets of disconnected implementation.	Cohesion enables routine integrated delivery; misalignment forces reliance on vertical, time-limited campaigns.

Implementation and delivery – teacher-anchored school health

School health programs work best when delivery follows the school calendar and daily routines, and when teachers have clear operational roles in planning and implementation. Coordination with schools is important to avoid exam periods, holidays, and unnecessary disruption. Across HPV experience, three teacher-supported functions are especially important: helping verify the target cohort through school registers, supporting communication and consent with parents and caregivers, and organizing vaccination-day logistics such as student flow, privacy, and observation. Reviews of LMIC programs describe teacher engagement in mobilization, consent, vaccination-day coordination, and follow-up of missed girls as highly valuable.

HPV vaccination remains a demanding test of school-level delivery capacity because it targets adolescents who do not routinely visit health facilities and therefore depends on reliable school organization, clear consent processes, and careful vaccine handling on outreach days. With the move toward single-dose schedules, the main issue is less universal second-dose completion and more whether programs can deliver in an orderly, trusted, and resilient way. Where teacher roles are embedded in school and district plans, delivery is more predictable and better able to absorb disruption. Where teacher roles are ad hoc, school-based vaccination is more likely to function like a campaign add-on, with weaker mobilization and a greater need for catch-up for girls missed on the first visit.

HOW IMPLEMENTATION UNFOLDS

Divide and Conquer as a strategy for creating an enabling environment for SHPs

To maximize efficiency and prevent staff burnout, the most resilient programs adopt a 'divide and conquer' strategy with a strict separation of roles. In this framework, Teachers manage the 'administrative spine'—accurately identifying eligible cohorts, managing consent forms, and organizing student flow. Meanwhile, Health Workers focus exclusively on the clinical task of vaccine administration and safety. This role clarity ensures that teachers act as the trusted 'social anchors' of the program while health workers focus on clinical delivery, a model that has been shown to achieve coverage rates exceeding 90% in school-based settings.

The practical role of schools begins with helping identify the target cohort accurately through school registers and coordination with local delivery plans, so that session planning is grounded in realistic numbers. Teachers also support communication with parents and caregivers and help organize the school timetable so vaccination can take place with minimal disruption.

On the day of delivery, school staff can help manage class flow, protect privacy, and supervise post-vaccination observation, while health workers focus on screening, administration, safety checks, and recording. In LMIC experience, early teacher engagement in social mobilization, consent processes, vaccination-day coordination, and follow-up of missed girls has been described as highly valuable.

Absentees are identified immediately; where schools are permitted to request follow-up days, revisits occur soon enough that completion does not slide. Districts that sequence their calendars around exam weeks and likely weather or transport disruptions, and that de-conflict overlapping outreach cycles, reduce cancellations and rework.[66] Across settings, when this rhythm is

66 Guillaume, D., Rosen, J. G., et al. (2023). Acceptability of an integrated school-based HPV vaccination program within two districts of

institutionalized and teacher roles are explicit, and where opt-in consent is implemented, school-based delivery has achieved high coverage – often clustering in the ninety-percent range for first-dose uptake (and, historically, for series completion where two-dose schedules applied)[67] – and outpaces facility-based adolescent vaccination by twenty to forty percentage points. Facility-based delivery may be less resource-intensive in some settings, but school-based delivery often achieves higher coverage and fewer missed girls; depending on the context, that can make it more efficient overall, though not always cheaper in absolute terms[68].

Category A: Classroom-embedded delivery with institutionalized teacher roles

Indonesia integrates deworming, nutrition checks, vision screening, and immunization into a fixed annual school health calendar through the UKS–BIAS platform. With more than 3.3 million teachers – nearly 1.9 million at primary level – UKS regulations require each school to appoint at least one trained teacher focal person responsible for class listing, consent management, and the delivery-day routine[69]. Administrative data show over 70% of public primary schools have at least one trained UKS teacher, and many urban schools have two. The effect is visible: health teams arrive to cohorts already pre-sorted for eligibility; teachers have organized classroom flow and prepared observation spaces; HPV runs as a routine add-on rather than a stand-alone intervention. Multiple provinces report first-dose coverage above 85% despite extreme geographic dispersion[70]. Where trained focal coverage is thinner, absentee recovery weakens and second-dose completion suffers, suggesting that continuity is mediated by teacher capacity as much as by supply.[71]

Indonesia's adoption of a single-dose HPV schedule using NUSAGARD further illustrates the interaction between delivery architecture and policy adaptation. The shift was operationally feasible because HPV was already embedded in a routinized school health platform. Moving to a single-dose regimen reduced follow-up tracking, eliminated second-round absentee recovery, and compressed delivery into one school contact per cohort, lowering transport, supervision, and cold-chain costs while reducing classroom disruption.[72]

Tanzania structures school health through Local Government Authorities and Comprehensive Council Health Plans. About 210,000 teachers work within this framework; every school designates a Teacher-in-Charge of Health whose role is recognized in council plans, and 55–65% of these teachers have standardized school health training. Trained teachers maintain registers, coordinate consent, and formally request visits through ward authorities, meaning services are triggered from inside the school routine. Before HPV introduction, this approach sustained deworming >90% and vitamin A >75% via schools; HPV was then integrated into the same logistics rather than introduced vertically. Councils with higher trained focal coverage are consistently among the stronger performers on first-dose uptake and second-dose completion, supported by systematic absentee recall.[73][74]

Côte d'Ivoire pairs a large teacher workforce, over 120,000 teachers, with PNSSU's dedicated

Tanzania: A qualitative descriptive study.

67 Reported coverage ranges and relative differences are drawn from programme documentation, comparative analyses, and situational assessments of school-based HPV vaccine delivery, including PATH and Gavi-supported work.

68 Gallagher, K. E., Howard, N., Kabakama, S., Mounier-Jack, S., Griffiths, U. K., Feletto, M., Burchett, H. E. D., LaMontagne, D. S., & Watson-Jones, D. (2017). Lessons learnt from human papillomavirus (HPV) vaccination in 45 low- and middle-income countries.

69 Yap, J., Satria, F. B., Alona, I., et al. (2025). Challenges in expanding access to the HPV vaccine among schooling girls: A mixed-methods study from Indonesia.

70 Ibid.

71 Ibid.

72 Gallagher, K. E., Howard, N., Kabakama, S., Mounier-Jack, S., Griffiths, U. K., Feletto, M., Burchett, H. E. D., LaMontagne, D. S., & Watson-Jones, D. (2017). Lessons learnt from human papillomavirus (HPV) vaccination in 45 low- and middle-income countries.

73 Rosen, J. G., Guillaume, D., Mlunde, L. B., et al. (2023). Feasibility and sustainability of a school-based platform for integrated HPV vaccination with adolescent services in Tanzania.

74 Guillaume, D., Rosen, J. G., et al. (2023). Acceptability of an integrated school-based HPV vaccination program within two districts of Tanzania.

school health staff working through service centers with defined catchments. Teachers are the organizational spine of these rotations: they schedule visits, prepare pupil lists, aggregate consent, and track defaulters between mobile rounds. Schools served by PNSSU maintain a designated teacher health liaison, a role defined in national policy. Structure solves continuity; classroom organization brings predictability. Together, they keep HPV and other services on a routine footing and stabilize coverage across urban and peri-urban districts[75].

Category B: Partial classroom integration with health-led delivery

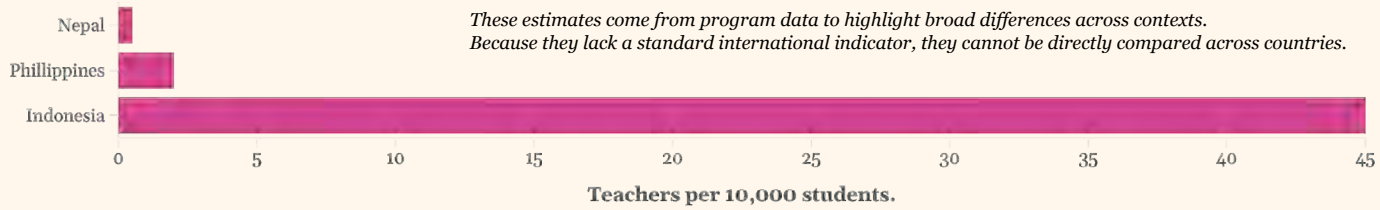
In the Philippines, more than 860,000 public teachers – nearly 480,000 in elementary schools – are fully institutionalized in hygiene, nutrition, and adolescent health promotion through WinS and EHCP.[76] Teachers distribute consent forms and mobilize classrooms, yet the levers that determine whether sessions happen (setting dates, supervising teams, authorizing follow-up) sit with the health system. After the Dengvaxia crisis, classroom awareness remained high, but coverage fell by 30–50% in multiple regions due to delayed or canceled rounds. Where municipalities co-financed transport and per diems for follow-ups drawn from teacher defaulter lists, recovery was faster. The lesson is plain: teacher energy converts to completed doses only when paired with authority and small, predictable budgets.[77,78]

In Zambia, approximately 110,000 teachers, about 80,000 at primary level, support nutrition, deworming, and school feeding logistics, but only 35–40% have structured school health training[79]. Teachers compile enrollment lists and mobilize pupils, yet vaccination teams follow donor-coordinated campaign schedules; teachers cannot authorize revisits or plan for shared catchments between neighboring schools. When partner logistics tightened, second-dose completion fell markedly, particularly in rural districts where health-team mobility is most constrained[80]. Without a named focal role with scheduling authority and financed revisit mechanisms, even strong classroom engagement does not hold a multi-dose schedule together[81].

Category C: Weak or peripheral classroom engagement

In Jordan's basic education system, where there are about 115,000 teachers, teachers support health education and supervision but are not designated to manage biomedical delivery. Vaccination teams enter schools on fixed campaign days; teachers may help organize queues but do not manage consent or defaulter tracking. In pilots conducted to date, HPV coverage rarely exceeded 50–60%, with wide regional variation and limited recovery for second doses – typical outcomes where schools are venues rather than delivery systems[82].

Figure 1. Institutional capacity: Density of trained school health focal points (illustrative)



75 Waheed, D.-E.-N., Bolio, A., Burdier, R., Guillaume, D., Biey, J., Ndiaye, C., Karafillakis, E., Kouassi, K. S., Vorsters, A., & Morgan, C. (2026). Barriers to HPV vaccine introduction and revitalization in sub-Saharan francophone African countries – A qualitative descriptive study.
76 BMJ Public Health. (2025). Medical knowledge, political tension, and social relevance: A content and framing analysis of vaccine-related TV broadcasts in the Philippines.
77 Mendoza, R. U., Valenzuela, S., & Dayrit, M. M. (2020). A crisis of confidence: The case of Dengvaxia in the Philippines
78 Department of Education. (2022). Data bits: Public school teachers SY 2020–2021
79 Simuyemba, M. C., Chileshe, M., Mulemena, J. A., Mwenda, S. C., Gotsche, M., & Stringer, J. S. A. (2024). An evaluation of the cost of human papilloma virus (HPV) vaccine delivery in Zambia.
80 Ibid.
81 Ibid.
82 Alyahya, L. A., Abu Farha, R., Mukattash, T. L., & Noor, D. A. M. (2024). Exploring parental awareness and attitudes towards human papillomavirus infection and vaccination for 9–15-year-old adolescents in Jordan.

In Nepal, a workforce of roughly 200,000 teachers operates under decentralized arrangements that leave responsibilities uneven. Municipal data suggest more than 40% of municipalities lack a designated school health focal teacher and fewer than 30% of schools report any teacher with school health training. Teams often notify schools only a few days in advance, leaving too little time to retrieve consent or mobilize absentees. Without teacher-controlled registers or financed revisit mechanisms, HPV delivery remains project-bound and highly sensitive to donor presence; completion between doses is especially vulnerable.[83]

CROSS-CUTTING IMPLICATIONS FOR PLANNING, EQUITY, AND COST

Teacher engagement appears to be associated with stronger delivery performance, rather than functioning as a fixed threshold. In settings where trained focal teachers are present and work closely with health teams, school sessions are better organized, communication with families is stronger, and follow-up of missed girls is more feasible. However, coverage also depends on other factors, including school enrollment, parental acceptance, and the quality of local implementation and communication.[84,85]

Authority and small budgets convert lists into visits. Philippine municipalities that funded transport and per diems for follow-ups transformed defaulter lists into completed schedules after the Dengvaxia shock.[86]

Organization matters more than mobility alone. School-based outreach runs more predictably when teachers and health teams divide responsibilities clearly: schools help identify and organize eligible students, while health staff manage vaccination, safety checks, and recording. In Côte d'Ivoire, the institutionalized PNSSU/SSSU model appears to support this kind of coordination between school actors and health services, which is a stronger point than mobility by itself.[87,88] Institutional calendars lower cost. When enumeration, consent, delivery, and follow-up are embedded in term plans and council cycles, cancellations and rework fall, lowering the incremental cost per fully vaccinated adolescent even in districts with difficult geography or seasonal disruptions.[89]

THE MINIMUM BACKBONE TO INSTITUTIONALIZE

A workable backbone can be expressed in straightforward terms. Class teachers own the age-specific lists and the consent process and keep both current throughout the term. Each school names a health focal teacher who plans the delivery day in advance with the visiting team, prepares privacy and observation spaces, and closes the reporting loop immediately afterward. The head teacher consolidates the school summary and passes it to the district health office, which reconciles doses administered with the expected cohort and authorizes short revisit windows when absentees exceed a reasonable threshold. District budgets cover small but predictable items, transport and per diems for follow-up visits, and periodic refresher training, so that when a delivery day is disrupted by exams, weather, or transport, the rescheduled visit happens quickly enough that completion does not slide.

83 Paudel, P. (2025). Human papillomavirus vaccine: a welcome addition to the national immunisation schedule in Nepal.
84 Rosen, J. G., Guillaume, D., Mlunde, L. B., Njiro, B. J., Munishi, C., Mlay, D., … Morgan, C. (2023). Feasibility and sustainability of a school-based platform for integrated HPV vaccination with adolescent services in Tanzania
85 Gallagher, K. E., Howard, N., Kabakama, S., Mounier-Jack, S., Griffiths, U. K., Feletto, M., Burchett, H. E. D., LaMontagne, D. S., & Watson-Jones, D. (2017). Lessons learnt from human papillomavirus (HPV) vaccination in 45 low- and middle-income countries.
86 Manila Standard. (2024). Medical community supports reinstating school-based HPV immunization.
87 Gavi/The Vaccine Alliance. (2025, April 7). Gavi supports Côte d'Ivoire's largest HPV vaccination campaign targeting over 3 million girls.
88 Waheed, D.-E.-N., Bolio, A., Burdier, R., Guillaume, D., Biey, J., Ndiaye, C., Karafillakis, E., Kouassi, K. S., Vorsters, A., & Morgan, C. (2026). Barriers to HPV vaccine introduction and revitalization in sub-Saharan francophone African countries – A qualitative descriptive study.
89 Thilly, N., Michel, M., Simon, M., & Ichou, L. (2024). Effectiveness of a school- and primary care–based HPV vaccination intervention: The PrevHPV cluster randomized trial.

These effects are seen as an observed association rather than a single-cause result. Where school-based delivery is better organized, programs tend to show more predictable uptake, fewer missed girls requiring follow-up, and less variation in performance across schools or districts. However, these outcomes are also shaped by enrollment, acceptability, communication, and other local implementation conditions.[90,91]

Table 4: Institutionalization of Delivery

Delivery Theme	Institutionalized / Embedded	Ad Hoc / Campaign-Style	Implications for HPV Outcomes
1. Planning and Target ID (Calendar, Cohorts)	Proactive and Accurate: Scheduled into annual plans avoiding exams; teachers maintain accurate grade-specific registers.	External and Reactive: Dates set by health teams on short notice; cohorts estimated externally or late.	Calendar alignment and accurate registers reduce cancellations, missed girls, and supply errors.
2. Teacher Execution (Roles, Consent, Logistics)	Explicit and Engaged: Trained teachers lead early consent, manage class flow, and handle day-of organization.	Informal and Delegated: Rushed/last-minute communication; health teams manage logistics alone.	Clear teacher roles and early, trusted communication improve consent return, efficiency, and safety.
3. Tracking and Follow-Up (Absentees, Revisits, Funding)	Local and Funded: Same-day absentee ID; local authority triggers revisits; predictable funding covers transport/catch-up.	Delayed and Unfunded: Late absentee ID; centralized/ donor-dependent revisit decisions; unfunded follow-up.	Empowered local authority and modest budgets convert defaulter lists into timely, completed catch-up visits.
4. Resilience and Outcomes (Integration, Performance)	Integrated and Resilient: Bundled with routine health (deworming, etc.); easily absorbs disruptions; high coverage (≥85-90%).	Isolated and Fragile: Stand-alone event; disruptions lead to skipped schools; lower, variable coverage (~50-60%).	System integration normalizes vaccination; strong organization drives resilience and explains high performance gaps.

90 Gallagher, K. E., Howard, N., Kabakama, S., Mounier-Jack, S., Griffiths, U. K., Feletto, M., Burchett, H. E. D., LaMontagne, D. S., & Watson-Jones, D. (2017). Lessons learnt from human papillomavirus (HPV) vaccination in 45 low- and middle-income countries.

91 Rosen, J. G., Guillaume, D., Mlunde, L. B., Njiro, B. J., Munishi, C., Mlay, D., Gerste, A., Holroyd, T. A., Giattas, M. R., Morgan, C., Kyesi, F., Tinuga, F., Ishengoma, J., Sunguya, B. F., & Limaye, R. J. (2023). Feasibility and sustainability of a school-based platform for integrated delivery of HPV vaccination with adolescent health services in Tanzania: qualitative insights from stakeholders.

Funding, budget flows and sustainability

School health programs are often operationally lower-cost compared to facility-based delivery, but they are nevertheless administratively demanding. Their sustainability depends less on the absolute size of budgets than on three structural features of financing:

- **Where funds originate** (domestic public budgets vs. donors)
- **At what level they are controlled** (national vs. district/municipal)
- **Whether costs are recurrent or project-based** (salaries, transport, supervision, data, vs. time-limited campaigns)[92]

HPV vaccination vividly exposes these dynamics. Unlike infant immunization, which is financed through long-established EPI budget lines, HPV requires school coordination, transport planning, teacher mobilization, consent processes, and adolescent tracking – all of which draw from the same fiscal architecture that sustains school health more broadly. Where these costs are recurrently financed, HPV becomes routinized; where they are project-funded, HPV remains episodic.[93]

DOMESTIC INSTITUTIONAL FINANCING VS. PROJECTIZED DELIVERY: A COMPARATIVE OVERVIEW

Across the three system categories, financing models diverge sharply in how cash moves, who controls it, and how far down the system it penetrates.

Category A: Institutionally embedded public financing

In stronger Category A systems, HPV delivery is supported through routine public financing, but the institutional pathway differs across countries. In Indonesia and Tanzania, implementation depends heavily on subnational planning and delivery capacity within decentralized systems[94,95] while in Côte d'Ivoire school health functions are more explicitly organized[96] through the PNSSU/SSSU national service structure.[97] These systems rely on recurrent public arrangements that support planning, coordination, and delivery over time.[98] Schools themselves receive small but recurring operational grants, which they routinely apply to teacher mobilization, reporting, and meeting costs.[99] Teacher participation is therefore supported through institutional petty-cash systems and school grants, which normalizes school engagement and stabilizes participation across years.[100]

Illustrative example. Côte d'Ivoire represents a distinct but similarly institutionalized school health model. School health is organized through PNSSU/PNSSU-SAJ, a national programme under the Ministry of Health that operates through specialized school health services (SSSU/CSUS). This

92 WHO & UNESCO. (2021). Making Every School a Health-Promoting School: Implementation Guidance. Geneva: World Health Organization.

93 Gallagher, K. E., Howard, N., Kabakama, S., Mounier-Jack, S., Griffiths, U. K., Feletto, M., Burchett, H. E. D., LaMontagne, D. S., & Watson-Jones, D. (2017). Lessons learnt from human papillomavirus (HPV) vaccination in 45 low- and middle-income countries.

94 Meyta, H. (2025). Multi-Sectoral Engagement and Coordination Approaches for HPV Vaccine National Scale-up. Directorate of Immunization, Ministry of Health, Republic of Indonesia.

95 Mphuru, A., Li, A. J., Kyesi, F., Mwengee, W., Mazige, F., Nshunju, R., Shayo, B., Giattas, M. R., Loharikar, A., & Lyimo, D. (2022). National introduction of human papillomavirus (HPV) vaccine in Tanzania: Programmatic decision-making and implementation.

96 Illustrative distribution informed by global evidence on immunisation financing, which shows wide variation across countries, with government spending typically accounting for 60–80% of total immunisation financing globally but substantially lower in donor-dependent settings (where external assistance can exceed two-thirds of total spending), and increasing over time as countries transition away from external support toward greater domestic financing. (Ikilezi et al., 2021; Kallenberg et al., 2016; Tandon & Reddy, 2021)

97 Ministère de la Santé et de l'Hygiène Publique et de la Couverture Maladie Universelle. (n.d.). Programme national de la santé scolaire et universitaire – santé adolescents et jeunes (PNSSU-SAJ). Portail officiel du Ministère de la Santé de Côte d'Ivoire

98 Ibid.

99 Rosen, J. G., Guillaume, D., Mlunde, L. B., et al. (2023). Feasibility and sustainability of a school-based platform for integrated HPV vaccination with adolescent services in Tanzania: Qualitative insights from stakeholders.

100 Ibid.

arrangement suggests a more centralized public-service model of school health delivery than the decentralized district-led arrangements seen in some other countries, although the precise payroll, budgeting, and financing mechanisms would need to be sourced directly if described in greater detail.[101,102]

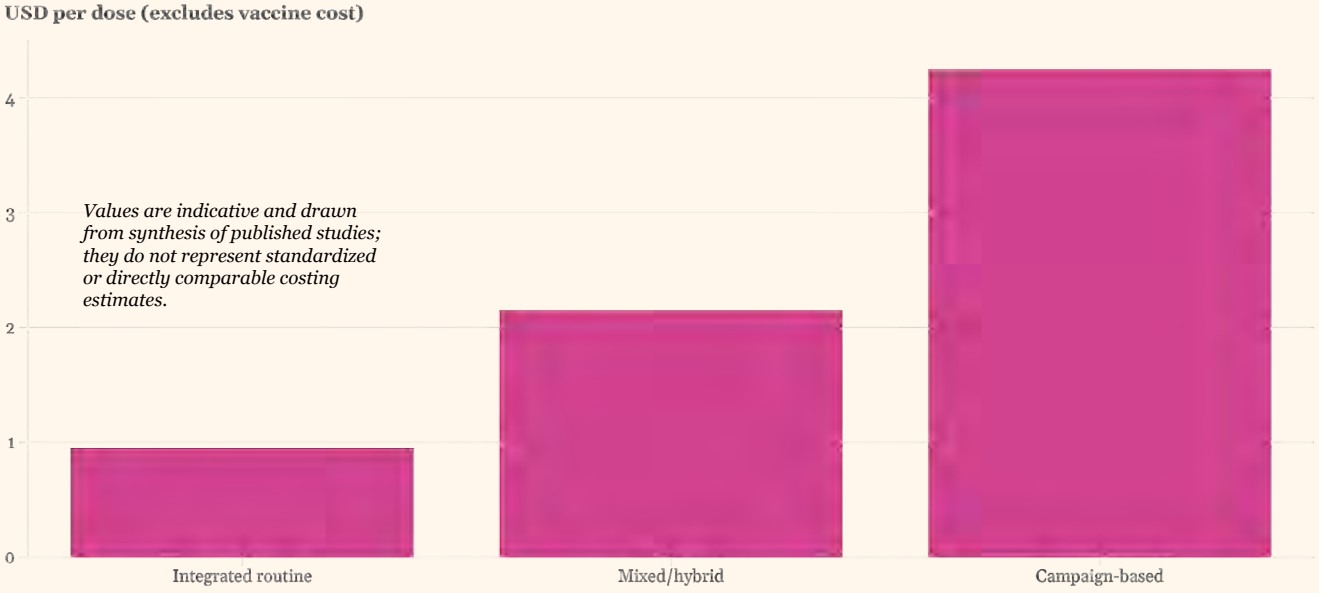
Sustainability implication:
Because delivery financing is embedded in Medium-Term Expenditure Frameworks and public payroll systems, HPV and other school health services persist even as donor support fluctuates. The system's financial resilience is therefore structural, not project dependent.

Figure 2. Illustrative operational ownership models



Category B: Hybrid financing with donor augmentation[103]

Figure 3. Illustrative comparison of delivery cost patterns across HPV delivery models.



101 Ministère de la Santé et de l'Hygiène Publique, République de Côte d'Ivoire. Document cadre de politique sur la santé scolaire (DC-PNS-SU) (2007).
102 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.
103 Illustrative cost differences informed by multi-country immunisation costing studies, which consistently show that delivery costs per dose are lowest for routine, facility-based platforms and increase for outreach, school-based, and campaign-style delivery due to higher logistical and operational requirements, including transport, per diems, and social mobilisation activities. (Levin et al., 2015; Portnoy et al., 2020; Vaughan et al., 2021)

Category B systems exhibit partial domestic financing of school health coupled with sustained donor dependence for delivery execution. Procurement is nationally financed, but delivery cashflows fragment across multiple payers, weakening predictability at the school level. In both the Philippines and Zambia, national health ministries procure vaccines centrally. However, delivery financing in these systems is not fully embedded as a recurrent function within either education or district health budgets. Key operational elements – such as transport, supervision, teacher mobilization, and training – are often financed through a patchwork of sources, including local government health budgets, donor-funded partner projects, and irregular education-sector contributions.

This reflects a narrower scope of routine public budgeting, rather than a failure to spend approved funds. Schools typically do not receive a protected or earmarked immunization delivery allocation through the education system, and teacher allowances for vaccination-related activities are therefore contingent rather than guaranteed. In practice, this means that delivery intensity is highest where partner funding is active and contracts when such financing recedes, even when national policy and technical guidance remain unchanged.[104,105]

Funding: Prioritizing "Operational" Resilience

While vaccine procurement is often the most visible budget line, experience from HPV and routine immunization program shows that recurrent operational functions – such as transport, supervision, planning, local coordination, and community engagement – are critical to sustaining delivery over time. The composition and relative weight of these costs vary widely by country and delivery model, but their reliable domestic financing is consistently associated with stronger program continuity.

Where national or local authorities fund these operational functions through routine public budgets, delivery systems are better able to maintain performance beyond donor or project cycles. This supports continuity of last-mile delivery even as external financing arrangements evolve, without implying a fixed cost share or uniform allocation pattern across settings.

Sustainability implication:
These models produce operational volatility: coverage fluctuates with yearly fiscal space and partner cycles rather than following stable public expenditure trajectories. HPV becomes fiscally exposed despite being formally adopted into national schedules.

Category C: Projectized and vertically financed delivery

Both procurement and delivery are frequently financed outside routine public expenditure frameworks. School health lacks protected budget lines within either health or education sectors, and HPV delivery remains functionally project based. In Nepal, decentralization transferred theoretical authority to municipalities, but fiscal execution capacity at municipal level remains weak.[106] School health budgets are often merged into general education accounts without defined delivery sub-allocations. As a result, HPV financing since introduction has remained heavily dependent on donors, covering training, transport, supervision, and teacher payments through

104 Gallagher, K. E., Howard, N., Kabakama, S., Mounier-Jack, S., Griffiths, U. K., Feletto, M., Burchett, H. E. D., LaMontagne, D. S., & Watson-Jones, D. (2017). Lessons learnt from human papillomavirus (HPV) vaccination in 45 low- and middle-income countries.
105 Simuyemba, M. C., ChamaChiliba, C. M., Chompolola, A., et al. (2024). An evaluation of the cost of human papillomavirus (HPV) vaccine delivery in Zambia.
106 UNICEF Nepal. (2025). Protecting our girls: HPV vaccination roll-out in Nepal.

time-bound project accounts.[107]

In Jordan, financing remains largely vertical within the health sector, with schools functioning as logistical venues rather than fiscal actors.[108] The education system does not receive delivery financing for immunization support, and teachers typically receive no formal compensation for mobilization beyond their base salaries.

Sustainability implication:
Where delivery financing is externalized from routine budgets, program continuity is structurally fragile. Once partner funding ends, school-based delivery contracts regardless of formal policy commitments.[109]

WHAT FINANCING PATTERNS REVEAL ABOUT SCHOOL HEALTH SYSTEM STRENGTH

Three financially grounded insights emerge across the comparison:

- **Delivery financing is a significant sustainability constraint.** While many countries can access HPV vaccines through pooled procurement mechanisms or donor support, sustaining school-based delivery depends on the ability to finance recurrent operational costs such as transport, supervision, training, and coordination. Vaccine procurement costs and delivery costs therefore interact, and the relative binding constraint varies by country context.[110][111]

- **Teacher-level cash access is the system's true last-mile bottleneck.** Where mobilization and reporting costs are paid through routine school or district budgets, school participation becomes normalized. Where teacher engagement depends on project stipends, performance fluctuates with partner cycles.

- Across the cases reviewed, **payroll-based delivery systems appear more resilient than per-diem-based outreach**, though the evidence base for this comparison in LMIC school health contexts remains limited. Campaign-style approaches can achieve high short-term performance when well-financed, particularly during introductions or intensive scale-up phases. However, systems that rely on permanent public staffing are better positioned to sustain delivery over time, manage disruption, and reduce dependence on repeated mobilization. Côte d'Ivoire's salaried PNSSU model demonstrates how shifting from campaign-style financing to permanent public staffing structurally stabilizes school health delivery.

Together, these patterns confirm that HPV also acts as a fiscal diagnostic of school health system maturity. Where money flows institutionally to the school level, HPV embeds. Where it does not, HPV remains financially and operationally fragile.

107 BMJ Global Health. (2025). HPV vaccine: Addition to Nepal's national immunisation schedule.
108 Alyahya, L. A., Abu Farha, R., Mukattash, T. L., & Mohamed Noor, D. A. (2024). Exploring parental awareness and attitudes towards HPV infection and vaccination for 9–15-year-old adolescents in Jordan.
109 Gallagher, K. E., Howard, N., Kabakama, S., Mounier-Jack, S., Griffiths, U. K., Feletto, M., Burchett, H. E. D., LaMontagne, D. S., & Watson-Jones, D. (2017). Lessons learnt from human papillomavirus (HPV) vaccination in 45 low- and middle-income countries.
110 Simuyemba, M. C., Chama-Chiliba, C. M., Chompolola, A., et al. (2024). An evaluation of the cost of human papillomavirus (HPV) vaccine delivery in Zambia.
111 Gallagher, K. E., Howard, N., Kabakama, S., et al. (2017). Lessons learnt from human papillomavirus (HPV) vaccination in 45 low- and middle-income countries.

Table 5: HPV Financing

Financing Theme	Institutionally Embedded	Projectized / Fragmented	Implications for HPV Sustainability
Budget Structure and Resilience (Origins, Framework, Continuity)	Domestic and Predictable: Embedded in medium-term public budgets; year-to-year resilience independent of donor cycles.	Donor-Reliant and Volatile: Time-limited project accounts outside routine budgets; delivery contracts when partners exit.	Domestic financing stabilizes long-term delivery; financial volatility translates directly into coverage drops.
Local and School Funds (Control, School Cash, Follow-Up)	Decentralized and Budgeted: District-controlled execution; schools get predictable operational cash; follow-ups/revisits are routinely budgeted.	Centralized and Unfunded: Externally or centrally controlled; schools lack earmarked delivery funds; follow-ups are unfunded/ conditional.	Subnational control and direct school-level cash drastically improve teacher engagement and absentee recovery.
Costs and Compensation (Cost Type, Teacher Pay, Procurement)	Recurrent and Payroll-Based: Finances recurrent costs (transport, data); teachers supported via payroll/grants; delivery is publicly financed.	Episodic and Ad Hoc: Finances episodic campaign costs; relies on ad hoc stipends; delivery funding remains fragmented.	Routinization only happens when recurrent costs are financed; payroll-based support is much more resilient than per-diems.
Efficiency and Delivery Mode (Admin Burden, Typical Mode)	Routine Service: High admin burden is efficiently absorbed by standing systems; operates as routine school health.	Campaign Outreach: Admin burden is amplified by repeated project start-ups; operates as vertical outreach.	The underlying financing architecture directly dictates whether HPV delivery functions as a routine or a fragmented campaign.



PHOTO BY MAUSAM MAJH (UNSPLASH)

Awareness, equity and accessibility

Awareness, equity, and accessibility operate as a tightly linked system within school health delivery: awareness shapes demand, equity determines who is reached, and accessibility governs whether intent translates into service uptake. Across the three country categories, the data show that these dimensions are driven by how information, financing, and delivery authority travel through education systems, and by the extent to which systems are able to extend beyond enrolled students to reach out-of-school adolescents where needed.[112]

Category A: High awareness, structured equity, and near-universal school access

In these systems, awareness of HPV vaccination is generated primarily through routine school and public health structures. However, the mechanisms differ by country. In Indonesia, awareness is largely mediated through the education system. Teachers play a prominent role in classroom-based information sharing, supported by school notices and engagement with parents. Evidence also shows that awareness is reinforced through local health services (*Puskesmas*) and trusted community figures, with face-to-face communication proving particularly important where written consent mechanisms alone are insufficient.[113]

In Tanzania, awareness is generated through a formalized school–health interface. School-based vaccination visits are preceded by group health education sessions delivered by health workers, often with teacher support. School administrations convene meetings with parents or caregivers, and students receive take-home information materials explaining the programme and vaccination schedule. These school-based efforts are complemented by wider outreach through health facilities and community channels, rather than replacing them.

In Côte d'Ivoire, awareness is best understood as part of an institutionalized school and adolescent health promotion system rather than as HPV-specific messaging alone. The national school health programme (PNSSU/PNSSU-SAJ) has a standing mandate for health promotion and prevention and works through schools and specialized school health services in collaboration with teachers and other partners. While HPV-specific communication pathways are less directly documented, awareness activities are embedded within broader adolescent health and information, education, and communication (IEC) functions rather than delivered as stand-alone campaigns.

Across these systems, equity is achieved in a school-linked but not school-exclusive way. Coverage is strongly associated with school enrollment, which explains why performance is higher where enrollment is high. Importantly, stronger SHPs also improve reach to out-of-school girls by anchoring identification, registers, and follow-up within routine local systems. Schools provide the core delivery platform, while health workers and community mechanisms are used to trace absentees and reach girls not enrolled, rather than leaving uptake entirely to household initiative.[114]

Accessibility in Category A systems is therefore institutional rather than household-driven. Where schools are used as the primary platform, vaccination can be scheduled within the academic calendar and managed through existing rosters and reporting systems. This reduces logistical burdens for households. In lower-enrollment areas, community outreach remains essential, but it operates more effectively when linked to a strong school health platform that already organizes planning, awareness, and follow-up.

As a result:

- Physical access costs drop significantly for households
- Missed-dose follow-up exceeds 85–90% completion within the same school year
- Gender and income gradients in access are substantially reduced at national level in well-functioning Category A systems[115]

112 World Health Organization, & UNESCO. (2021). Making every school a health-promoting school: Global standards and indicators.
113 Ibid.
114 Li, A. J., Manzi, F., Kyesi, F., et al. (2022). Tanzania's human papillomavirus vaccination program: Community awareness, feasibility, and acceptability of a national HPV vaccination program, 2019.
115 Thilly, N., Michel, M., Simon, M., et al. (2024). Effectiveness of a school- and primary care–based HPV vaccination intervention: The PrevHPV cluster randomized trial.

- HPV uptake in these countries therefore tracks school reach, not household income, with community outreach serving only as a complementary channel for hard-to-reach or out-of-school adolescents.[116]

Category B: Moderate awareness with persistent access frictions

Awareness exists but remains campaign-dependent. 40–60% of HPV awareness is generated through short-cycle donor or NGO outreach, with spending clustered around campaign periods rather than as recurrent budget lines. Pre-campaign student awareness typically ranges from 45–65%, rising to 70–80% only during active project windows.[117] Equity is uneven and fiscally mediated. While national averages sometimes resemble Category A (HPV coverage at 65–75%), district-level variance is extreme, with remote or under-resourced districts falling below 40–50% coverage.[118] This divergence aligns closely with: variations in district health co-financing capacity; transport budgets for mobile outreach teams; and availability of teacher time for non-core academic duties. Out-of-school girls in these systems are inconsistently reached and depend largely on whether donor-funded outreach is active in a given district-year.[119]

Accessibility barriers persist because schools function as sites of delivery, but not as controllers of delivery. Vaccination days are negotiated between district health offices and schools, often with short notice. Where transport or refrigeration logistics fail, entire zones are skipped with no automatic re-scheduling mechanism. Household costs re-enter the access equation through missed school days, parental consent retrieval and travel to secondary catch-up sites. As a result, accessibility ceases to be universal and becomes conditional on district fiscal strength and operational capacity, not national policy.

Category C: Low awareness, regressive equity, and household-dependent access

Awareness tends to be episodic and campaign-dependent in Category C countries. Between 60–80% of HPV awareness spending flows through donor communication campaigns, with per-student spending often exceeding USD 1.20–1.80, yet delivered inconsistently. Outside active campaign periods, baseline awareness among eligible girls frequently drops below 30–40%.[120]

Equity in these systems is structurally regressive. Since over 70% of HPV delivery costs are project-financed, service reach mirrors NGO geographic footprints rather than school enrollment patterns. Urban districts and donor-accessible regions record 60–70% coverage, while remote districts frequently fall below 25–35%. Marginalized populations, including out-of-school girls, face overlapping disadvantages: lower school enrollment, weak outreach financing and higher household travel costs.[121]

Accessibility is no longer institutional but privatized at the household level. Where schools lack authority or funding to host services, girls are either referred to clinics or depend on temporary outreach posts. This shifts: transport costs, time costs, and consent and information burdens onto households. In practical terms, this produces a two-tier access system: those near donor-served zones receive services, while equally eligible cohorts elsewhere – and especially out-of-school girls – remain structurally unreachable.

HPV outcomes reveal that where money flows through education systems, access improves; where money flows around education systems, access becomes selective.

116 Maness, S. B., Carpenter, L. C., Akpan, I., et al. (2025). Health equity and human papillomavirus vaccine interventions for adolescents: A systematic review.
117 Larson, H. J., Hartigan-Go, K., & de Figueiredo, A. (2019). Vaccine confidence plummets in the Philippines following dengue vaccine scare: Why it matters to pandemic preparedness.
118 Ibid.
119 Lubeya, M. K., Chibwesha, C. J., Mwanahamuntu, M., et al. (2024). Determinants of the implementation of human papillomavirus vaccination in Zambia:
120 World Health Organization, & UNESCO. (2021). Making every school a health-promoting school: Global standards and indicators.
121 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach out-of-school girls in LMICs: A narrative review.

OPERATIONAL IMPLICATIONS AND DEEPER EFFECTS

Awareness is a budget function, not just a communications task. Evidence from HPV and routine immunization programs suggests that awareness is most durable when communication is embedded in routine local systems – such as schools, health facilities, and community structures – rather than delivered solely through one-off national campaigns. Small, recurrent resources at district or school level (for example to support parent meetings, local language messaging, and engagement of trusted community figures) enable repeated, contextualized communication that families encounter multiple times through channels they already trust. Where these routine capacities are weak or absent, studies report greater persistence of misinformation and lower consent, particularly among households with limited or irregular contact with schools. This implies that national media campaigns are most effective when complemented by sustained local engagement rather than used as stand-alone interventions.

Equity requires actionable lists and local responsibilities. Policy statements about reaching out-of-school adolescents are less impactful without concrete instruments: an OOS register updated periodically as part of routine delivery and follow-up, explicit assignment of responsibility (which department or volunteer follows up), and a modest pooled mop-up fund at district level to finance targeted visits. Without these, equity gains in pilot districts evaporate after project close.

Accessibility depends on calendar alignment and predictable micro-funding. School calendars must become the primary planning axis for delivery teams. When delivery windows are scheduled centrally but not aligned with local exam periods, timetabling conflicts produce large no-show rates. Moreover, predicting small transport and allowance needs in advance – rather than depending on emergency partner payments – avoids last-minute cancellations that disproportionately hurt poorer, remote, and out-of-school populations.

Where trust is fragile, misinformation contributes to clustered low-coverage pockets. Evidence from multiple immunization programs shows that hesitancy and misinformation tend to generate geographically and socially clustered pockets of low uptake, shaped by local trust dynamics and dominant information channels. These clusters can occur in marginalized communities with limited institutional contact, but also in highly connected urban settings where social media narratives circulate rapidly ahead of program launch – as observed, for example, in urban Nigeria. The implication is not that access alone determines equity outcomes, but that early, trusted, and locally grounded engagement is critical to preventing misinformation from translating into persistent consent gaps in both urban and marginalized contexts.

In contexts where awareness, equity, and accessibility are institutionally financed and governed for School Health Programs (SHP), the result is a stable, effective initiative characterized by high service continuity (with ≥90% year-on-year retention), stable teacher participation that is not distorted by per-diem incentives, and predictable demand for commodities and logistics. Conversely, when these same dimensions are externally financed, program outcomes become volatile and district-dependent, teachers disengage once temporary incentives lapse, services revert to less accessible clinic-based models, and gender and poverty gradients widen sharply – especially for out-of-school adolescents.

Table 6: Sources, channels and uses of the PNSSU-SAJ budget for HPV vaccination

System Theme	Institutionalized Model	Campaign-Dependent / Fragmented	Implications for HPV Uptake
Awareness and Communication (Timing, Actors, Financing)	Continuous and Local: Embedded in routine systems; led by trusted local actors (teachers); funded by recurrent resources.	Episodic and External: Peaks only during short-term campaigns; relies on external communicators and time-limited project budgets.	Routine, locally led exposure produces durable awareness; campaign-driven awareness collapses outside active windows.
Equity and Reach (Out-of-School Girls, Gradients)	Systematic Tracking: Minimal income/geographic disparities; out-of-school (OOS) girls tracked via local community registers.	Donor-Driven: Strong urban-rural and income disparities; OOS reach is inconsistent and relies on funded outreach.	Financing models shape who is systematically missed; OOS reach fails without institutional responsibility.
Accessibility and Burden (Mechanisms, Costs, Scheduling)	Low Burden: Organized via schools; aligned with calendars; zero household costs (no travel or time off required).	High Burden: Household-mediated (clinics/outreach); centrally scheduled; high costs (travel, missed work/school).	Shifting access costs and logistics to households directly reduces uptake and increases no-shows.
System Maturity and Outcomes (Follow-up, National Patterns)	Routine Recovery: Financed, planned follow-ups for missed doses; national coverage closely tracks school enrollment.	Conditional Catch-up: Follow-up depends on partner availability; national coverage tracks donor presence.	Routine follow-up signals system maturity; ultimately, the flow of money predicts access more than policy intent.



PHOTO BY TOSIN OLOWOLENI (PEXELS)

Data and performance monitoring, monitoring–evaluation–learning

Data and performance monitoring within School Health Programs function not only as measurement tools but as the operational nervous system that determines whether delivery is visible, accountable, and capable of course correction. Across the three country categories, HPV reveals that effective SHP performance correlates less with the number of indicators collected and more with where data authority sits, how routinely reporting is embedded in school systems, and whether feedback loops operate at the same tempo as service delivery.[122]

Where education data are linked with health reporting platforms, MEL sustains performance.
In stronger systems, monitoring of HPV delivery relies on a division of data functions rather than a single system. Vaccination administration data are typically recorded and reported through routine health information systems (such as DHIS2), while enumeration data – including school enrollment, class rosters, and age-eligible cohorts – are generated and maintained by the education sector. Performance is more sustainable where these data streams are actively synchronized, allowing health teams to plan delivery against verified school denominators and to reconcile doses delivered with expected cohorts.[123,124]

Where enumeration exists only in parallel project tools or is not routinely shared across sectors, visibility into coverage gaps declines and learning is lost once projects close. By contrast, when education-owned lists and registers are routinely used alongside DHIS2 vaccination reporting, local teams are better able to track absentees, identify missed girls (including those out of school), and adapt delivery in real time.[125]

Category A: Integrated, routine, and authoritative data systems

In these systems, HPV data are fully embedded within national education and health information platforms. School-level reporting is institutionalized through EMIS and DHIS2, with head teachers and designated focal teachers formally accountable for completeness and timeliness.[126] Reporting is continuous rather than episodic: HPV indicators are captured within the same termly reporting cycles used for enrollment, attendance, and other SHP services. Data completeness in these systems routinely exceeds 95% at national level, with internal consistency checks conducted through routine school supervision rather than special surveys. Tanzania reports near-universal same-round reporting for both first and second HPV doses, while Indonesia integrates HPV records directly into student health cards, allowing longitudinal tracking across grades.[127]

Data: Digital Interoperability (ASIK and DAPODIK)

To eliminate administrative errors and reduce the burden of manual paperwork, countries should prioritize digital data interoperability between sectors. In Indonesia, the linking of the ASIK (health record) application with the DAPODIK (education database) allows for a real-time digital 'handshake'. This integration enables health workers to instantly identify and follow up with 'missing' girls by cross-referencing school enrollment lists with vaccination status. These interoperable systems are essential for 'Health 4.0' initiatives, significantly improving the speed and accuracy of adolescent health tracking.

122 WHO & UNESCO. (2021). Making every school a health-promoting school: Global standards and indicators.
123 Rosen, J. G., Guillaume, D., Mlunde, L. B., Njiro, B. J., Munishi, C., Mlay, D., Gerste, A., Holroyd, T. A., Giattas, M. R., Morgan, C., Kyesi, F., Tinuga, F., Ishengoma, J., Sunguya, B. F., & Limaye, R. J. (2023). Feasibility and sustainability of a school-based platform for integrated delivery of HPV vaccination with adolescent health services in Tanzania.
124 World Health Organization, UNICEF. (2022). Behavioural and social drivers of vaccination: Tools and practical guidance for immunization programs.
125 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach outofschool girls in LMICs: A narrative review.
126 Rosen, J. G., Guillaume, D., Mlunde, L. B., et al. (2023). Feasibility and sustainability of a school-based platform for integrated adolescent services in Tanzania.
127 Li, A. J., Manzi, F., Kyesi, F., et al. (2022). Tanzania's HPV vaccination program: Community awareness and acceptability of a national HPV vaccination program.

Data are actively used for performance management. District review meetings compare expected versus reported uptake within weeks of delivery, enabling immediate identification of underperforming schools. Schools falling below expected uptake thresholds are flagged for follow-up within the same academic term rather than referred to later campaigns.[128] As a result:

- **Drop-out** between first and second HPV dose **remains consistently below 10%**[129]
- **Missed-school follow-up completion exceeds 85%** within the same school year[130]
- **Data discrepancies are resolved at source** through direct head-teacher verification[131]
- **Learning is operational rather than retrospective.** Performance data inform calendar adjustments, community sensitization timing, and supervision intensity within the same delivery cycle.[132] OOS girls are captured through simple annex registers maintained by community education officers, allowing partial visibility beyond enrolled populations without distorting the core school-based system.[133]

Category B: Partially institutionalized data with irregular feedback loops

In these systems, HPV and SHP indicators exist in national reporting frameworks, but routine integration with school information systems is incomplete. Reporting responsibility is often split between health workers and teachers, with parallel registers maintained at facility and school level. This dual reporting architecture creates delays, duplication, and frequent reconciliation challenges.[134]

During active delivery periods, reporting completeness often reaches 80–90%, but timeliness remains inconsistent. Data may arrive weeks or months after delivery, limiting the ability of district teams to act within the same academic calendar.[135] Outside active project windows, routine reporting typically falls to 60–70% completeness, especially in remote districts.[136]

Performance review processes exist but function intermittently. Data are often aggregated upward for national reporting without systematic downward feedback to individual schools. Consequently:

- **Low-performing schools are identified late**
- **Missed-dose tracing becomes retrospective** rather than preventive
- **District comparisons occur annually** rather than intra-term[137]

Equity-related disaggregation (by sex, district, urban–rural) is generally available, but OOS tracking is weak and inconsistent. Where OOS data exist, they are usually derived from stand-alone outreach lists rather than integrated education records, limiting longitudinal tracking.[138]

128 Côte d'Ivoire Ministry of Health. (2024). PNSSU Annual Report: School health and HPV integration.
129 Li, A. J., Manzi, F., Kyesi, F., et al. (2022). Tanzania's HPV vaccination program: Community awareness and acceptability of a national HPV vaccination program.
130 UNICEF Indonesia. (2025). A future without cervical cancer: Protecting Indonesia's girls through HPV immunization.
131 Rosen, J. G., Guillaume, D., Mlunde, L. B., et al. (2023). Feasibility and sustainability of a school-based platform for integrated adolescent services in Tanzania.
132 Thilly, N., Michel, M., Simon, M., et al. (2024). Effectiveness of a school- and primary care–based HPV vaccination intervention: The PrevHPV cluster randomized trial.
133 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach out-of-school girls in LMICs: A narrative review.
134 Lubeya, M. K., Chibwesha, C. J., Mwanahamuntu, M., et al. (2024). Determinants of the implementation of human papillomavirus vaccination in Zambia
135 Department of Health Philippines. (2024). Essential Health Care Program Implementation Review. Manila.
136 Lubeya, M. K., Chibwesha, C. J., Mwanahamuntu, M., et al. (2024). Determinants of the implementation of human papillomavirus vaccination in Zambia:
137 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.
138 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach out-of-school girls in LMICs: A narrative review.

Learning occurs mainly at project close through formal evaluations rather than through continuous adjustment during delivery.[139]

Category C: Project-bound, fragmented, and non-routine data systems

In Category C countries, MEL for HPV and SHP operates primarily through externally designed reporting tools that exist outside national education and health information systems. Data collection is intensive during project implementation but lacks continuity between cycles.[140] Schools often report through temporary paper forms or contractor-managed digital tools that are not interoperable with EMIS or DHIS2.[141]

Reported completeness during campaigns may reach 85–90%, but data quality audits routinely identify high levels of internal inconsistency, including mismatches between school enrollment denominators and reported vaccination counts.[142] Between projects, routine reporting frequently drops below 40–50%, with no institutional mechanism to sustain visibility.[143]

Data authority in these systems is weak. Schools submit information, but feedback is rarely returned in a usable form. District officers often receive aggregated results months after delivery, too late to support operational learning.[144] As a result:

- **Missed schools are rarely revisited** within the same academic year
- **In multi-dose HPV vaccination schedules, attrition between doses is commonly observed**, with global data indicating a meaningful gap between first-dose and full coverage. The magnitude of this attrition varies widely by country and delivery model, and is often higher in early implementation phases and in campaign-based or outreach delivery settings.[145]
- **Reported coverage fluctuates sharply** between cycles[146]

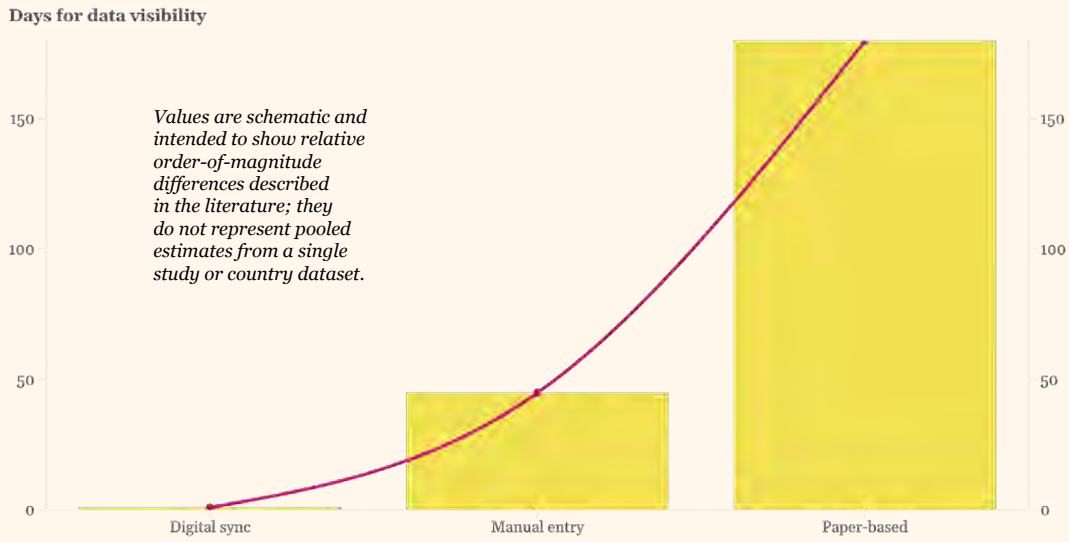
Tracking of OOS girls is almost entirely dependent on individual outreach projects and disappears once those projects end. Without an institutional data home, OOS monitoring cannot be sustained, and denominators remain unstable across years.[147]

Learning in these settings is largely extractive rather than iterative. Data are used to satisfy donor reporting requirements rather than to guide mid-course correction in delivery systems. The same operational weaknesses therefore recur across successive project cycles.[148]

139 Han, L., Zhu, J., Dong, Y., Jin, Y., Wang, Y., Zhang, X., & Ma, J. (2025). Global HPV vaccination programs and coverage rates: A systematic review.
140 Paudel, P. (2025). Human papillomavirus vaccine: A welcome addition to the national immunisation schedule in Nepal.
141 WHO Nepal. (2025). Nepal vaccinates over 1.46 million girls with HPV vaccine.
142 ICO/IARC HPV Information Centre. (2023). Human papillomavirus and related diseases in Jordan: Summary report.
143 Alyahya, L. A., Abu Farha, R., Mukattash, T. L., & Mohamed Noor, D. A. (2024). Exploring parental awareness and attitudes towards HPV infection and vaccination for 9–15-year-old adolescents in Jordan.
144 WHO EMRO – Jordan. (2024). Immunization: Programme overview & demand generation.
145 Global analyses show a gap between first-dose (61.6%) and full-dose (47.6%) HPV vaccination coverage, implying meaningful attrition between doses; however, this varies widely across countries and delivery models, with higher drop-off often observed in settings relying on campaign or outreach delivery, …with higher attrition often reported in donor-dependent or campaign-based delivery contexts where follow-up systems are weaker. (Han et al., 2025; Felsher et al., 2024)
146 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach outofschool girls in LMICs: A narrative review.
147 Bonner, K., Banura, C., & Basta, N. E. (2018). HPV vaccination strategies targeting hard-to-reach populations: Out-of-school girls in LMICs.
148 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.

How to interpret the graph

Figure 4: Illustrative reporting latency by data capture modality



Digital sync *(~1 day) reflects real-time or near-real-time submission through DHIS2 mobile or interoperable systems, as described in WHO guidance.*

Manual electronic entry *(~weeks) reflects settings where paper tallies or local spreadsheets are entered periodically into DHIS2 at district or regional level.*

Paper-based *(~months) reflects fully paper-based aggregation cycles where national visibility depends on sequential compilation and reporting rounds.*

The figure illustrates relative latency, not performance guarantees.

Institutional governance and integrated data authority are essential for stable, responsive School Health Program outcomes

1. **Data authority determines responsiveness.** Where schools possess formal reporting authority within national systems, performance issues are detected and corrected within the same delivery cycle.[149] Where data authority is external, problems are recorded rather than resolved.

2. **Timeliness matters as much as completeness.** High reporting rates lose operational value when data arrive after the academic calendar has advanced.[150] Systems that link reporting to routine school supervision outperform those reliant on post-hoc aggregation.

3. **Fragmented reporting weakens learning.** Parallel health and education reporting streams generate inconsistent denominators and dilute accountability.[151] Integrated systems produce clearer performance signals and stronger corrective action.

4. **OOS visibility requires institutional anchoring.** OOS monitoring remains fragile everywhere, but is only minimally sustainable where it is formally attached to district education structures rather than to individual projects.[152]

5. **MEL maturity predicts stability.** Countries with routine, school-embedded data systems show low year-to-year volatility in HPV coverage. Countries with project-bound MEL show large oscillations between delivery rounds, regardless of medical readiness.[153]

149 WHO & UNESCO. (2021). Making every school a health-promoting school: Global standards and indicators.
150 Thilly, N., Michel, M., Simon, M., et al. (2024). Effectiveness of a school- and primary care–based HPV vaccination intervention: The PrevHPV cluster randomized trial.
151 Rosen, J. G., Guillaume, D., Mlunde, L. B., et al. (2023). Feasibility and sustainability of a school-based platform for integrated adolescent services in Tanzania.
152 JSI / HAPPI Consortium. (2025). Strategies, challenges, and opportunities to reach out-of-school girls with HPV vaccination in six LMICs.
153 Maness, S. B., Carpenter, L. C., Akpan, I., et al. (2025). Health equity and human papillomavirus vaccine interventions for adolescents: A systematic review.

HPV experience within SHP demonstrates that performance monitoring is most powerful when it is routine, authoritative, and temporally aligned with the school system itself. Across all three categories, the decisive distinction is whether schools and districts are the permanent custodians of the performance information they produce.

Table 7: MEL for HPV and SHP

MEL Theme	Integrated, Routine MEL	Project-Bound / Fragmented	Implications for HPV Performance
Systems and Authority (Linkage, Location, Enumeration)	Embedded and Synced: EMIS and DHIS2 are synchronized; schools/districts hold reporting authority; uses official education rosters.	Parallel and External: Non-interoperable systems; authority sits outside education; relies on project lists or health estimates.	Linked systems and stable denominators (class rosters) are essential for tracking real, accurate coverage.
Reporting Mechanics (Cadence, Completeness, Timeliness)	Routine and Timely: Embedded in termly cycles; highly complete (≥95%); same-round or rapid reporting.	Episodic and Delayed: Campaign-based cadence; variable completeness; reporting lags by weeks or months.	Late or incomplete data cannot support active, within-cycle corrective action; timeliness is as vital as completeness.
Feedback and Management (Function, Loops, Reviews)	Operational and Local: Drives course correction; local in-cycle reviews; downward feedback provided directly to schools.	Upward and Retrospective: Focuses on donor reporting; annual or end-project reviews; upward aggregation only.	Downward feedback and local, in-cycle reviews actively convert data into performance improvement.
Learning and Outcomes (Drop-outs, Learning Mode, Patterns)	Iterative and Stable: Within-term drop-out correction; embedded learning; yields stable, high coverage with low volatility.	Extractive and Fluctuating: Retrospective drop-out detection; extractive learning; yields fluctuating coverage with recurring gaps.	MEL maturity predicts overall delivery stability; early detection is the only way to prevent severe attrition.

Cross-cutting insights

Across all country groupings, the evidence converges on a clear conclusion: governance and coordination are the primary structural drivers of success in school health programs.

Governance and coordination act as the system's central backbone, shaping the performance of every other criterion:

- **District-level autonomy enables adaptive, context-specific interventions.**
- **Integrated SHPs strengthen data flows, institutional trust, and operational efficiency.**
- **Mixed delivery models improve coverage while safeguarding equity.**

A second major lesson is the decisive role of district-level autonomy in translating national policy into real-world outcomes. In higher-performing systems, districts control microplanning, school calendars, outreach rosters, and routine supervision. This enables rapid operational adaptation to local geography, seasonal school attendance patterns, and population mobility.

The analysis also shows that integrated school health platforms fundamentally strengthen data, trust, and efficiency at the same time. When schools are formally embedded within reporting systems – rather than treated as passive delivery sites – data completeness improves, follow-up becomes routine, and community trust deepens through repeated, predictable interactions with familiar institutions. These trust effects extend beyond vaccination to other adolescent services, reinforcing the school as a legitimate health access point rather than a one-off campaign venue.

HPV vaccination with a package of adolescent health services in schools was perceived to be more efficient and resource-saving by stakeholders. These efficiencies were attributed to shared use of school-based delivery structures – such as combining deworming, vision screening, nutrition checks, health education, and HPV vaccination into a single cohesive program[154]. Operational disruption to schools also declines: fewer teaching days are lost, transport is shared across programs, and community sensitization can be synchronized. In contrast, stand-alone vertical campaigns repeatedly recreate high fixed costs for each new intervention.

Finally, the evidence supports the value of mixed delivery models – those combining routine school-based delivery with structured outreach for out-of-school and highly mobile adolescents. In the countries studied, school-based delivery platforms are more likely to achieve lower unit costs compared to facility-based or outreach models, and are often associated with higher completion rates. Yet, equity gaps only close when districts retain modest, predictable resources for targeted outreach. Systems that rely exclusively on either schools or campaigns perform worse than those that deliberately integrate both.

Taken together, these lessons underscore that HPV delivery success through schools is not primarily a function of vaccine logistics or clinical capacity, but of how effectively school health systems are governed, financed, and operationalized at district level. Countries that have invested in those institutional foundations achieve not only higher HPV coverage, but also stronger data systems, more stable teacher engagement, lower delivery costs, and more equitable adolescent health outcomes overall.

154 Rosen, J. G., Guillaume, D., Mlunde, L. B., et al. (2023). Feasibility and sustainability of a school-based platform for integrated adolescent services in Tanzania.

Comparative policy dynamics and system function

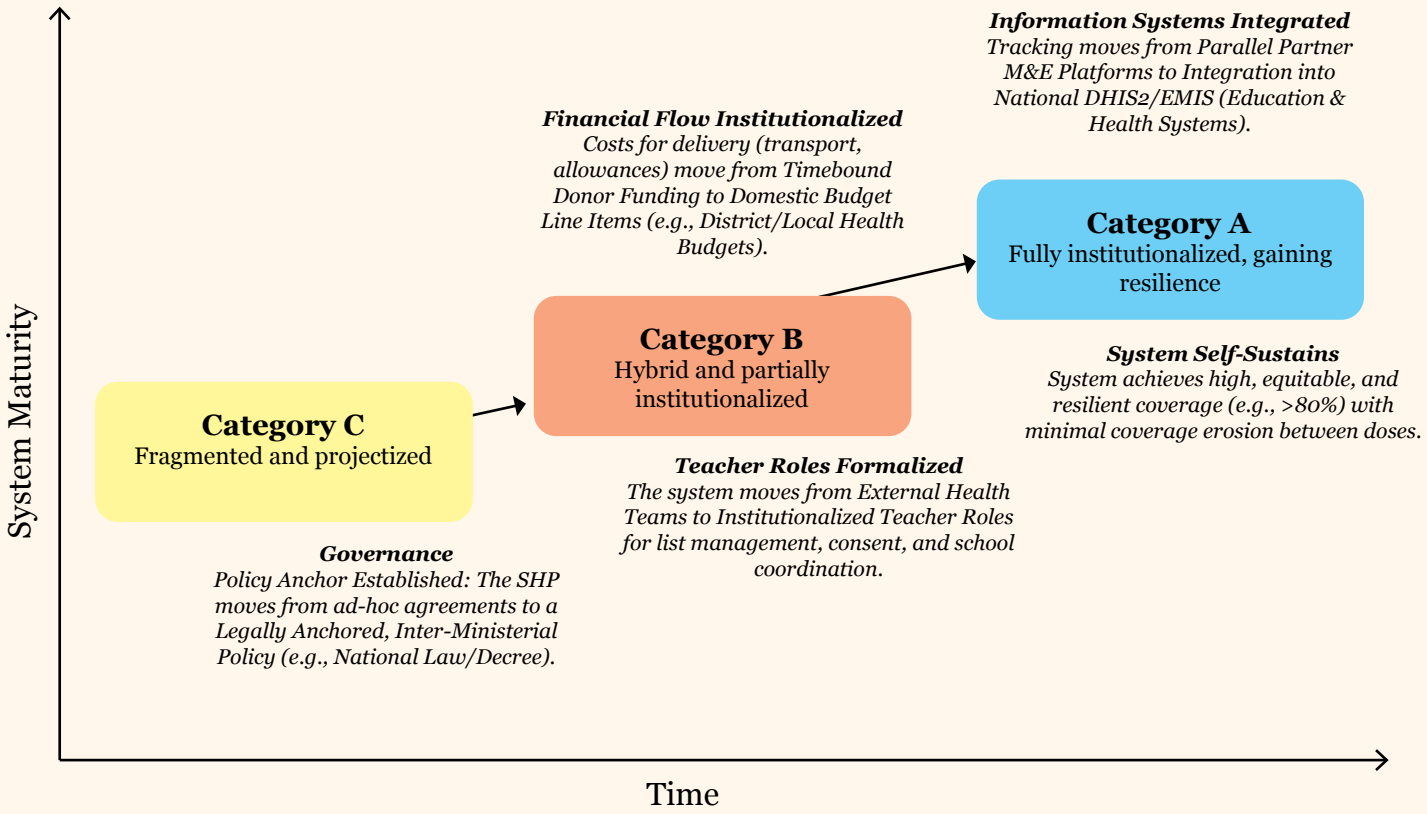
This chapter moves beyond the five operational dimensions to examine the external, political, and organizational forces that shape whether School Health Programs (SHPs) become routine public services or remain episodic interventions. The goal is analytic description and comparative learning: what internal pathways and external forces produce institutionalization, what costs result when systems remain fragmented, which components appear transferable, who holds power and how they behave, and where empirical gaps remain.[155]

SYSTEM BENCHMARKING AND DESCRIPTIVE POLICY LEARNING

The comparative case material points to repeatable, observable sequences that Category A countries followed as they moved from pilot activity to routine SHP institutionalization. These pathways are descriptive: they show what occurred, not why any given country must copy them.[156]

This sequence is not strictly linear in practice: jurisdictions loop, pause or accelerate through phases depending on politics, financing, and external shocks. However, the pattern is repeated often enough to identify policy-relevant signals: a legal/policy anchor (Phase 1) generally precedes durable budget embedding (Phase 4) in Category A; where that anchor is missing, the later phases rarely stabilize.[157]

Figure 5: The SHP Maturity Pathway: From Project-Driven to Institutionalized Routine Delivery



THE COST OF FRAGMENTATION

Fragmentation: the absence of that multi-phase institutionalization, yields observable, recurring costs at program and system levels:[158]

155 WHO & UNESCO. (2021). Making every school a health-promoting school: Global standards and indicators.
156 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach out-of-school girls in LMICs: A narrative review.
157 Rosen, J. G., Guillaume, D., Mlunde, L. B., et al. (2023). Feasibility and sustainability of a school-based platform for integrated adolescent services in Tanzania.
158 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.

- **Repeated fixed costs:** Campaigns re-create planning, IEC production, transport mobilization, and training each cycle, inflating programmatic unit costs by an order of magnitude relative to incremental costs in routinized systems.[159]
- **Poor targeting and wastage:** Without reconciled school registers and district microplans, vaccine allocations mismatch denominators; either wastage or stockouts rise[160].
- **Data opacity and delayed response:** Parallel project reporting masks who is missed; corrective mop-ups are late and inefficient.[161]
- **Equity gaps:** Donor footprints determine access; remote and out-of-school adolescents are persistently under-reached.[162]
- **Political and institutional fragility:** Short-term programs leave no sustained institutional memory; when partners exit, operational capability often collapses.[163]

These costs are descriptive and cumulative: the same dollars spent episodically deliver far less durable population coverage than when allocated to small recurrent functions (teacher training, district microplanning, routine supervision) inside an institutionalized SHP.[164]

TRANSFERABILITY ANALYSIS: LOW-COST/HIGH-IMPACT COMPONENTS

Not every element in Category A is politically or financially portable. Yet the comparative evidence points to a subset of components that appear relatively low-cost and high-impact across contexts — and therefore worth piloting for transferability. The short table below summarizes them and notes practical barriers.

Table 8: Institutional anatomy of HPV vaccination in schools

Component	Why it is low-cost / high-impact	Common barriers to transfer
Teacher focal role + 1–2 days training	Uses existing workforce; improves denominator control, consent, and day-of logistics; marginal recurrent cost.	Union resistance if workload perceived unpaid; bureaucratic inertia to formalize role.
District microplanning template	A simple planning tool that standardizes routes, cold chain scheduling, and mop-up triggers; low tech and fast to scale.	Requires district-level coordination capacity and minimal data inputs.
Simple OOS annex register	Minimal, rolling annex to existing school or ward registers that captures girls identified as out of school during routine delivery and follow-up; supports targeted outreach with low maintenance cost.	Political sensitivity over OOS enumeration; requires community follow-up capacity.
Two-touch IEC protocol tied to school calendar	Pre-tested messages delivered by teachers + PTA reminders cut misinformation and increase consent; low media cost.	Needs basic IEC budget and teacher buy-in.
Routine reconciliation of school registers with DHIS2 tally	Improves denominator accuracy and reduces wastage without new hardware in many settings.	Requires interoperability work and short training for data clerks.

159 Thilly, N., Michel, M., Simon, M., et al. (2024). Effectiveness of a school- and primary care–based HPV vaccination intervention: The PrevHPV cluster randomized trial.
160 Maness, S. B., Carpenter, L. C., Akpan, I., et al. (2025). Health equity and human papillomavirus vaccine interventions for adolescents: A systematic review.
161 Han, L., Zhu, J., Dong, Y., Jin, Y., Wang, Y., Zhang, X., & Ma, J. (2025). Global HPV vaccination programs and coverage rates: A systematic review.
162 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach out-of-school girls in LMICs: A narrative review.
163 Paudel, P. (2025). Human papillomavirus vaccine: A welcome addition to the national immunisation schedule in Nepal.
164 Bonner, K., Banura, C., & Basta, N. E. (2018). HPV vaccination strategies targeting hard-to-reach populations: Out-of-school girls in LMICs.

Political context remains the principal barrier: local institutional incentives, interministerial turf, and union negotiation power can prevent even low-cost technical changes from being adopted. Transferability therefore demands attention to political feasibility, not just technical cost.

KEY STAKEHOLDER ANALYSIS: INTERESTS AND INFLUENCE

Understanding who holds power – and what motivates them – explains why some reform pathways succeed while others stall. The analysis below is descriptive: it maps relative interest and influence and characterizes how typical stakeholder incentives have shaped the patterns observed.

Table 9: Stakeholder influence–interest snapshot

Stakeholder	Typical interests / incentives	Relative influence on SHP institutionalization
Ministry of Health (MoH)	Health priorities, disease control targets, immunization coverage metrics; prefers facility control of clinical services	High technical authority; variable operational influence in schools unless formally partnered
Ministry of Education (MoE)	School calendar, teacher workload, curriculum delivery; cautious about medical activities hosted in schools	High gatekeeper power over school access and administrative authority; critical to institutionalization
District/Bureaucracy (Education and Health))	Deliverables on budgets and services; pragmatic orientation to local constraints and political leaders	High operational discretion — often the de facto decision-maker for microplanning and execution
Teachers and Unions	Workload, pay, status, job security; skeptical of unpaid additional tasks	Teachers are essential for execution; unions can block or require compensation
Donors / NGOs / Partners	Rapid coverage gains, project deliverables, demonstration effect; short- to medium-term funding horizon	Has catalytic influence but can encourage dependency if funding substitutes domestic functions
Community leaders / PTAs / Parents	Child welfare, school performance, social reputation; trust matters deeply	Can accelerate or block uptake through social influence
Political leaders (national and local))	Visible achievements, electoral/campaign priorities; may reorient resources quickly	Can unlock policy windows or redirect funding flows suddenly

HOW STAKEHOLDER INCENTIVES SHAPE OUTCOMES (DESCRIPTIVE PATTERNS)

MoH vs MoE turf dynamics: Where MoH retains sole authority over immunization budgets and MoE lacks budget or legal mandate for biomedical services, joint governance is fragile. Systems that formalize shared responsibility, joint decrees or technical committees, reduce negotiation friction and stabilize school access. In contrast, informal sharing of duties without formal mechanisms produces recurring negotiation cycles and uneven school participation (Category B patterns[165]).

165 Schultz, L., & Ruel-Bergeron, J. (2021). Considerations for Monitoring School Health and Nutrition Programs. Frontiers in Public Health.

Teacher/Union calculus: Teachers are decisive implementation agents. Where teacher roles are formalized, even modest non-financial recognition, training, and predictable small administrative allowances stabilize engagement. Where extra tasks are informal and uncompensated, teacher willingness is inconsistent, generating variability in attendance lists, consent retrieval, and day-of order.[166]

Donors' dual role: Donors accelerate scale-up and can finance institutional pilots; however, when donor inputs finance core recurrent functions (e.g., transport, teacher allowances, data clerks), they may inadvertently discourage domestic budget absorption and prolong dependency (a common pattern in Category C). Conversely, donors that prioritize financing transition plans and systems strengthening are more likely to catalyze institutionalization.[167]

District bureaucracy as operational gatekeeper: Mid-level officials interpret national policy into practice. Their discretion – whether they prioritize SHP in annual microplans, secure transport slots, or enforce school reporting – directly determines system performance. In many cases, district-level commitment explains more of the variance in outcomes than national directives.[168]

POLICY WINDOWS AND CRITICAL JUNCTURES

Institutional change rarely proceeds absent an enabling political moment. Category A countries advanced major shifts during identifiable windows; the description below highlights typical triggers and the actors who seized them.

EXOGENOUS SHOCKS AND ENABLERS

Health scares and disease framing: High-profile outbreaks or national burden data often function as catalysts. A visible disease burden or public-health shock raises political salience, creating the option space for institutional reforms that previously lacked appetite.[169]

Political transitions and executive mandates: New administrations or ministers sometimes issue top-down directives (decrees, budget priorities) that formalize cross-sectoral mandates; these windows are short but decisive when aligned with technical readiness.[170]

Donor funding shifts / global targets: Waves of global attention (e.g., Gavi windows, WHO elimination targets) can provide the fiscal and normative push to formalize SHP functions – particularly if donors condition funds on systems rather than campaigns.[171]

Media and civil society mobilization: High-visibility advocacy – often by NGOs or civil society coalitions – can elevate adolescent health on national agendas and make institutional reform politically attractive.[172]

166 Rosen, J. G., Guillaume, D., Mlunde, L. B., et al. (2023). Feasibility and sustainability of a school-based platform for integrated adolescent services in Tanzania.
167 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach out-of-school girls in LMICs: A narrative review.
168 Lubeya, M. K., Chibwesha, C. J., Mwanahamuntu, M., et al. (2024). Determinants of the implementation of human papillomavirus vaccination in Zambia:
169 Larson, H. J., Hartigan-Go, K., & de Figueiredo, A. (2019). Vaccine confidence plummets in the Philippines following dengue vaccine scare: Why it matters to pandemic preparedness.
170 WHO EMRO. (2024). Immunization: Programme overview & demand generation.
171 Rosser, E. N., Wysong, M. D., Rosen, J. G., Limaye, R. J., & Park, S. (2025). HPV vaccine delivery strategies to reach outofschool girls in LMICs: A narrative review.
172 London School of Hygiene & Tropical Medicine. (2018). Dramatic drop in public confidence after Philippines dengue vaccine controversy.

THE ROLE OF POLICY ENTREPRENEURS

Across the high-performing cases, institutionalization was not merely structural; it was also agentic. Small groups or individuals – in ministries, districts, or civil society – combined technical credibility with political access and acted as connectors between evidence and political opportunity. Common characteristics:

- **Bilingual competence:** They spoke the language of health (epidemiology, logistics) and the language of education and budgets.
- **Vertical connectivity:** They had access to senior decision-makers and local implementers simultaneously.
- **Practical credibility:** They led feasible pilots that demonstrated operational viability (not just conceptual plans).
- **Persistence through cycles:** They sustained momentum across ministerial or donor turnover.
- Descriptively, these **policy entrepreneurs take advantage of short windows** (a new budget cycle, a political inauguration, or donor restructuring) to move from pilot to policy – converting technical fixes into institutional commitments.[173]

173 Maness, S. B., Carpenter, L. C., Akpan, I., et al. (2025). Health equity and human papillomavirus vaccine interventions for adolescents: A systematic review.

Conclusion

REAFFIRMATION OF THESIS

Across all countries studied, HPV delivery performance consistently functions as a diagnostic indicator of underlying School Health Program (SHP) system strength. High and sustained HPV coverage is not primarily a reflection of clinical capacity or partner intensity, but of deeper institutional conditions; most critically, governance coherence, financing reliability, and routinized delivery systems.

FINAL SYNTHESIS

The empirical distinctions between Categories A, B, and C reflect differences in system functionality rather than program effort. Category A countries operate as integrated functional systems, where adolescent health services are embedded within routine state delivery platforms, supported by predictable financing, formal inter-ministerial coordination, and continuous data feedback loops. Category B reflects hybrid systems, where routine delivery exists but remains partially dependent on external operational support. Category C countries function as episodic platforms, where delivery is campaign-driven, partner-dependent, and structurally disconnected from core public sector mechanisms – resulting in volatility, inefficiencies, and weak institutional learning.

CLOSING STATEMENT

The evidence demonstrates that routine adolescent service delivery at scale is sustained not by isolated technical inputs, but by the alignment of governance authority, financial predictability, district-level operational autonomy, and continuous performance monitoring. Where these conditions are institutionally embedded, delivery becomes automatic and resilient; where they are absent, service provision remains intermittent, externally driven, and fragile; regardless of clinical readiness or short-term funding availability.

Annex: A Theory of Success for School Health Programs

Evidence from the cross-country analysis indicates that successful School Health Programs (SHPs) are not defined by the scale of individual campaigns, the intensity of partner support, or short-term coverage gains. Rather, they succeed when they function as routine public service systems embedded within the institutional, administrative, and fiscal architecture of the state. In such systems, school-based health delivery operates with the same predictability as other core public services, following established calendars, budget cycles, and reporting routines.

Across countries, sustained and equitable performance emerges when five system conditions operate together. First, SHPs require formal governance authority. Where school health is legally anchored through joint mandates between ministries of health and education, schools are authorized to host and organize health services as part of their normal administrative function. This legal clarity reduces reliance on ad hoc permissions, stabilizes intersectoral coordination, and allows districts and schools to plan with confidence. Where governance remains informal, school health delivery depends on temporary arrangements and external facilitation, making continuity fragile.

Second, effective SHPs depend on teacher-anchored delivery roles. Teachers translate policy into execution by maintaining accurate class-by-age registers, managing consent and communication with households, organizing delivery days, and identifying absentees for follow-up. When these roles are formally defined, trained, and recognized within school routines, delivery becomes orderly and predictable. When teacher involvement is informal or peripheral, delivery behaves like a campaign: sessions are more easily disrupted, absentee recovery weakens, and completion rates fall, particularly for multi-contact interventions.

Third, sustained performance depends on recurrent domestic financing at the level where delivery occurs. While vaccine procurement or commodity financing is necessary, it is insufficient to sustain school health delivery. The critical costs are operational: transport, supervision, coordination, and reporting. Systems that embed these costs in routine public budgets or payrolls create continuity across years and reduce exposure to funding shocks. In contrast, systems that rely on project-based financing for delivery functions experience volatility, as performance rises and falls with donor cycles rather than following stable public expenditure patterns.

Fourth, successful SHPs are organized around school-centered planning and authority. Schools possess unique, real-time knowledge of enrollment, attendance, and timing constraints. When school calendars and registers anchor microplanning, delivery schedules align with academic routines, and absentees can be identified and recovered quickly. Where planning authority sits outside the school system, services are more likely to clash with exams, weather disruptions, or staffing constraints, leading to cancellations and uneven coverage. School-centered planning thus reduces operational friction while improving both efficiency and equity.

Finally, successful SHPs rely on owned data systems and rapid feedback loops. Where schools and districts report through routine education and health information systems, data are timely, authoritative, and actionable. This enables performance issues to be identified and corrected within the same school year, rather than retrospectively through evaluations. In contrast, project-bound data systems produce delayed visibility and weak institutional learning, allowing the same operational failures to recur across delivery cycles.

When these five conditions align, formal governance, teacher-anchored delivery, recurrent financing, school-centered planning, and owned data, schools function as organizing platforms

rather than passive venues. Delivery follows the school calendar rather than external timelines; absentee follow-up becomes routine; equity improves as services reach beyond better-resourced districts; and marginal delivery costs fall. Coverage stabilizes at high levels, typically exceeding 80–90 percent, and performance becomes predictable year to year.

This theory of success explains why similar technical guidelines produce divergent outcomes across countries, why high-intensity campaigns can achieve short-term gains without sustainability, and why HPV vaccination performance reliably reflects underlying school health system strength. HPV does not create system capacity; it reveals whether the institutional conditions required for routine adolescent service delivery already exist.

The policy implication is that strengthening SHPs is less about introducing new interventions and more about institutionalizing a small set of recurrent functions within existing systems. Investments that formalize teacher roles, embed delivery costs in routine budgets, align planning with school calendars, and integrate data into government-owned systems are more likely to produce durable gains than repeated cycles of project-based delivery. In this sense, effective SHPs should be understood not as projects to be implemented, but as public infrastructure to be built and maintained.

PHOTO BY SILVERE MEYA (UNSPLASH)

About Haskè Group

Through its three entities, Haskè Conseil, Haskè Ventures, and Ignite.E, Haskè Group supports a diverse range of actors (including governments, the private sector, technical and financial partners, NGOs, foundations, and universities) in the formulation and implementation of high-impact strategic solutions.

Haskè Group positions itself as a catalyst for innovative strategies, combining technical expertise, systemic vision, and a sense of action. The group is involved in public policy consulting, private sector development, entrepreneurship, and the creation of sustainable ecosystems, while supporting the localization of strategies and the co-creation of solutions with stakeholders.

Haskè Group draws on deep knowledge of local realities, a strong multi-stakeholder network, and a community-embedded approach to deliver solutions rooted in lived realities. This field presence enables Haskè Group to bridge strategic vision and operational impact.

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