LEARNING BRIEF

INTEGRATE HPV - MOZAMBIQUE

Implementation Research on Community Generated, Integrated Solutions to Increase HPV Vaccination Coverage

MAY 2026

Project Overview

Cervical cancer is the fourth most common cancer among women globally, with Mozambique facing one of the world's highest incidence and mortality rates. Persistent human papillomavirus (HPV) infection is responsible for 95% of cases, and HPV vaccination is a proven preventive measure (WHO, 2024). In Mozambique, the national HPV vaccination programme was launched in 2021 under the Expanded Programme on Immunization (EPI) at a two-dose scheme, targeting nine-year-old girls through a combination of fixed facility-based services and community outreach (MISAU, 2024).

Despite initial high coverage for the first dose in 2022 (94%), the last dose coverage lagged at 32%, indicating substantial challenges in completing the schedule recommended at the time. From 2022 to 2023 the first dose coverage also dipped by 26 percentage points, down to 68% (WUENIC, 2022—2023).

In June 2024, Mozambique transitioned from a two-dose to a single-dose HPV vaccination schedule for girls aged 9 years old. This transition to a one-dose regimen sought to reduce logistical burdens, simplify delivery requirements, and minimize missed opportunities for vaccination completion. Encouragingly, the most recent WHO/UNICEF data for 2024 showed 89% HPV vaccination coverage for the target population (WUENIC, 2024).

While the most recent wave of coverage data is promising, there is still much to learn about what contributes to high coverage and how to sustain it over time.

Gavi The Vaccine Alliance | Gates Foundation | SCOPE IMPACT | VillageReach

In January 2025, **VillageReach launched a study to design, implement, and evaluate integrated approaches to increase HPV vaccination uptake and coverage**. The study had three main objectives:

1. **Generate community-led, integrated solutions to HPV vaccine delivery** through a series of Human Centered Design (HCD) sessions with adolescents, caregivers, health workers, community leaders, and educators
2. **Implement solutions prioritized by local stakeholders and gather ongoing feedback** to make real-time adjustments and understand facilitators and barriers to successful implementation
3. E**valuate** whether solutions impacted H**PV vaccination coverage and/or use of integrated services**, and conduct a **costing assessment** to understand costs and sustainability of the integrated solutions

Project Design

The study employed a quasi-experimental, mixed methods approach. Working with the Mozambique Ministry of Health, we selected three intervention and three comparison facilities in Cahora Bassa and Tsangano districts of Tete Province, totaling twelve catchment areas.

We leveraged quantitative and qualitative methods to inform solution design, understand implementation successes and challenges, and evaluate impact.

Specific methods

- **HCD sessions** with a mix of stakeholders that generated insights into general barriers to HPV vaccination and those related to integration, and were the mechanism through which communities designed and prioritized locally-tailored solutions.
- **A difference-in-difference (DID) analysis leveraging facility records** to understand the impact of integrated solutions on uptake of HPV vaccination and integrated services
- **Key informant interviews (KIIs)** with caregivers, adolescents, educators, health workers, and local and national Ministry of Health representatives
- **Knowledge, Attitudes, and Practices surveys** with health workers, educators, and model mothers as key players in the integrated solutions
- **Costing surveys** with health workers, educators, Ministry of Health, and program staff to capture costs associated with delivering the integrated package
- **Focus group discussions with adolescents** at midline evaluation (intervention and control areas)
- **Focus group discussions with caregivers** during endline data collection (intervention and control areas)

The community-designed, integrated solution package

Adolescents, caregivers, health workers, educators, and community leaders shared barriers to and preferences for integrated HPV vaccination delivery. Through iterative design and prioritization, **stakeholders coalesced on an approach centered on both supply and demand considerations to improve HPV vaccination uptake** through integrated delivery.

Table 1. Solution package that was implemented

1. Integrate HPV vaccination with adolescent and youth friendly services (AYFS)		
Point of Delivery	**Prior to Intervention**	**Intervention Package**
Health Facility	HPV vaccination delivered through EPI services, while AYFS operated separately. MCH nurses working in AYFS did not routinely provide HPV vaccination.	• **Develop integrated care protocols** for adolescent girls in the health facility • **Train maternal and child health (MCH) nurses on communication, administration, and documentation** of the HPV vaccine and EPI technicians to support vaccine management • **Train MCH nurses and EPI technicians on referral procedures** within the health facility
Schools	AYFS and HPV vaccination were formally included within the School Health Program, however, integration remained weak in practice. There was limited joint planning and coordination between teachers and health workers, leading to errors in microplanning, poor alignment of vaccination sessions with school schedules, and inefficient vaccine quantification.	• **Train EPI staff and MCH nurses on planning and criteria for prioritizing schools** for vaccination sessions • **Train teachers on the importance of joint planning and prioritization** of school vaccination sessions • **Adapt and implement planning tools for teachers and health professionals** (Eligible girls lists, prioritization matrix, and content planning) • **Improve vaccine quantification** based on the actual number of eligible girls • Enhance **coordination between school committees and health facilities**
Community	Nurses and EPI technicians participated in outreach, but HPV vaccination was not systematically integrated.	**Promote the "one space, many services" approach** during health fairs, health days, and outreach activities, and strengthened the **integration of HPV vaccination within AYFS in mobile brigades**

2. Create demand for HPV vaccination

Host community talks to increase awareness of HPV vaccines among adolescent girls and their caregivers

- Train model mothers and girls on communication techniques, including how to prepare, organize, and conduct educational talks, with support from CHWs and community leadership.
- Train model mothers and adolescent peer educators on the importance of HPV vaccines, the use of IEC materials, and for model mothers to refer girls to the health unit.
- Establish a flexible plan for talks and household visits.
- Reproduce and provide visibility and IEC materials for use during talks and household visits.
- Engage model mothers, teachers, girls, community leaders, and Community Health Workers (CHWs) in radio programmes.
- Produce radio spots in the local language, age-appropriate and culturally sensitive.

Host school talks to raise awareness of HPV vaccines among adolescent girls and support health staff in jointly planning and prioritizing HPV vaccination sessions

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Results

HPV Vaccination Uptake

HPV vaccination uptake increased across both intervention and comparison sites over the study period, with intervention sites experiencing a larger absolute increase.

Table 2. Total number of vaccinations per study arm at baseline and endline

	Baseline	Endline	Pre-post change (%)
Intervention	916	1,970	115.10%
Comparison	732	1,379	88.40%

Table 3 depicts the percent change in total vaccinations from baseline to endline at each service delivery point, including a notable 896.2% increase in school-based vaccinations in the intervention arm from baseline to endline.

Table 3. Total number of vaccinations per study arm and delivery point

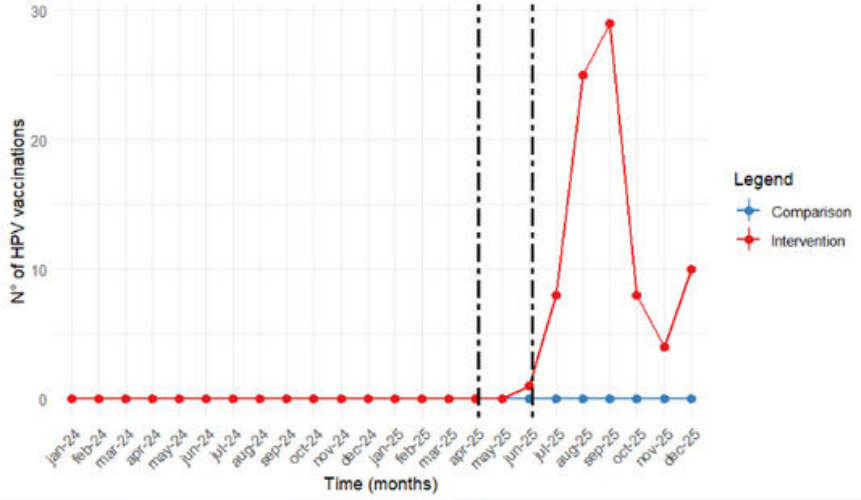
	Delivery point	Baseline	Endline	Pre-post change
Intervention	Facility	598	621	3.80%
	Outreach	213	303	42.30%
	School	105	1,046	896.20%
Comparison	Facility	545	622	14.10%
	Outreach	54	310	474.10%
	School	133	447	236.10%

Pre-post analyses show **statistically significant increases in school vaccinations and total vaccinations** (across all delivery points) for both study arms, per center per month. No significant changes were observed for facilities or mobile brigades.

Difference-in-differences analysis suggests a **positive trend in favor of the intervention when it came to school-based vaccinations**, although this did not reach statistical significance (IRR=2.139, p=0.114).

Vaccinations delivered through the Adolescent and Youth Friendly Services (AYFS) platform also showed a modest positive trend in intervention sites. No HPV vaccinations were recorded within the AYFS platform at baseline in either arm. At endline, 85 vaccinations were observed in the intervention sites while comparison sites continued at 0 vaccinations (Figure 1). Endline analysis suggested a potential impact with a marginally significant effect (p = 0.074), signaling that AYFS may serve as a complementary platform to reach adolescents.

Figure 1. Mean trends of HPV vaccination delivered directly through the AYFS platform per study arm



Use of Adolescent and Youth Friendly Services

The total number of **AYFS users showed a marked pre-post increase in intervention sites, contrasted with a decrease at comparison sites** (Figure 2). This pattern is consistent with the pre-post comparison of means, which shows a significant increase in usage at the intervention sites and a significant decrease at comparison sites (Table 4).

Figure 2. AYFS total users (percentage change, baseline to endline)

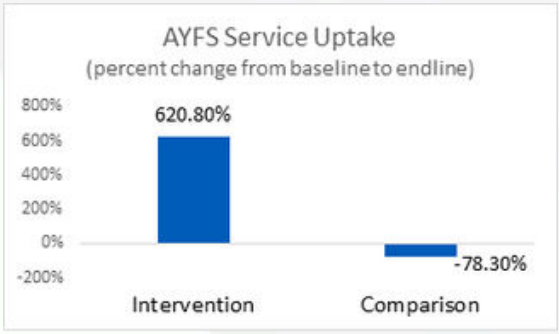


Table 4. Mean comparison of total AYFS users, per facility, per month

	Baseline	Endline	Difference	Percent difference	p-value
Intervention	1	6.8	5.8	595.20%	**<0.001**
Comparison	8.3	2.2	-6.1	-57.40%	**0.032**

Qualitative findings from health workers provide important context to increased use of AYFS services. Health workers consistently described the integrated model as a "one-stop service," where each adolescent contact is used to deliver multiple interventions, thereby reducing missed opportunities. This operational approach was perceived to generate immediate benefits, including increased demand and strengthened two-way referral pathways between vaccination services (EPI) and AYFS.

In Cahora Bassa (CS Chinhanda), **health workers highlighted integration—particularly when linked to school-based delivery—as a key driver of service uptake:** The findings suggest that **integration can strengthen linkages between platforms and points of service while increasing uptake.**

> *"The success [is that] we receive many adolescent girls coming from the school seeking our [AYFS] services, counseling, and other support."*
>
> *— Health worker, Cahora Bassa*

Difference-in-differences (DID) analysis confirms a **statistically significant 643% increase in the intervention arm over the comparison arm, reinforcing evidence of increased AYFS service uptake linked to the intervention ($p < 0.001$).**

It is important to note, however, that the observed effects cannot be attributed to the integration component specifically, as integration was one piece of the solution package. It is likely that the intentional demand generation activities spurred increased attention to and use of AYFS.

Feasibility

Integrated delivery was feasible across schools, mobile brigades, and adolescent/youth-friendly services. The increase in HPV vaccinations provided at AYFS was modest, but the fact that any HPV vaccinations were conducted by AYFS nurses demonstrates a plausible pathway for reaching girls.

Health workers confirmed that integrated **HPV vaccination could be incorporated into existing routines, demonstrating operational feasibility**.

Key operational challenges remain, particularly shortages of vaccination cards and recording tools, highlighting the **need for supply planning to sustain quality**:

> *"The integration should continue so that we do not experience many losses… we have been facing shortages of cards, especially since the HPV campaign, and currently we have a very high demand for cards." —Health worker, Cahora Bassa district*

Acceptability

Caregivers reported highly valuing integration of HPV vaccination with other adolescent health services. In Tsangano, co-delivery with vitamin supplementation and nutritional counseling reduced travel and waiting time, making visits more convenient.

> *"It made things easier because we didn't have to travel to the health unit." —Caregiver, Tsangano district*

In Cahora Bassa District, where HPV vaccination was integrated mainly with counseling, caregivers reported easier access and high acceptability.

> *"We don't need to walk; we don't need to stand in the queue. We didn't spend money… we know the nurses are bringing vaccines, condoms, prevention methods, and family planning." —Caregiver, Focus Group Discussion, Cahora Bassa district*

Health care workers described th**e integration of HPV vaccination with AYFS services as operationally advantageous and widely acceptable.** One-stop service delivery reduced missed opportunities and made each adolescent encounter more productive:

> *"With the introduction of the [HPV] vaccine, we now have a higher flow in service demand, because we leverage the adolescent who comes for HPV to include other services." —Health worker, Tsangano district*

Integration at the point of care, with co-location and referrals, **reduced waiting time and strengthened adherence:**

> *"We reduced loss because in the same consultation the girl receives other services beyond the one she came for." —Health worker, Tsangano district.*

Knowledge and Attitudes

Knowledge measured on a 0–6 scale (e.g., "Is cervical cancer caused by persistent HPV infection?") was compared between the intervention and comparison arms, adjusting for baseline. After adjusting for gender, age, and clustering by center, the **intervention group showed a significant increase** of 0.94 points relative to the comparison group, **indicating that the intervention was effective in increasing HPV-related knowledge among health workers** (p= 0.048).

Among educators, the i**ntervention was effective in increasing HPV-related knowledge among educators, with intervention school educators demonstrating significantly higher HPV knowledge** relative to their counterparts at comparison schools, scoring 2.5 points higher on a 7-point scale (p=0.0017).

Educators' attitudes toward HPV vaccination were slightly more positive in intervention groups, particularly for items requiring deeper knowledge, suggesting the training package may improve understanding and acceptance.

At the community level, most caregivers in the intervention areas were aware that an HPV vaccine exists and associate it with preventing cervical cancer, while focus group discussions in control areas suggested lower awareness and more confusion about the vaccine.

Rumors and misconceptions persist, most notably around the vaccination causing infertility and confusion with contraception, or mix-ups with other vaccines. These beliefs seem to have declined but still circulate in areas where sensitization has taken place. Caregivers in both study arms **stressed the importance of repeated, timely communication from health workers** about the vaccination and its importance.

Model Mothers, who led community dialogues on HPV to raise awareness and demand, showed persistent gaps in knowledge at endline despite receiving training from district and project staff during implementation. For instance, nearly half of the Model Mothers (48%, n=11) believed that a person with HPV will always display symptoms.

Cost

The intervention cost approximately **$66.71 per girl vaccinated** (excluding HCD costs), or **$77.46 including HCD costs** annualized over five years. The incremental cost per additional vaccination was **$206.43** — reflecting the short implementation period and the high proportion of one-off costs (64% of total). Total costs were **$228,414**, comprising HCD costs of $96,998 and delivery costs of $131,416. Incremental costs would be expected to fall substantially with longer implementation.

Key Challenges

The project team experienced several challenges during study implementation:

- **Timing of the HPV MAC campaign:** The campaign was conducted in late September, which significantly reduced the available target population for the intervention, as many eligible girls had already been vaccinated. This limited the ability to fully assess the added value of integrated service delivery approaches.

- **Competing campaign schedules**: Overlapping national and provincial campaigns (e.g., polio) created operational constraints, affecting coordination, availability of health staff, and access to schools and communities, ultimately reducing intervention reach.

- **Short implementation period:** The limited timeframe (June–December) constrained comprehensive rollout, capacity building and follow-up activities, reducing the potential to observe sustained changes in service delivery practices and vaccination uptake.

- **Data system limitations:** Challenges in introducing or adapting facility registers hindered the effective tracking of HPV vaccination within integrated service delivery. Existing tools did not adequately capture client flow across services, limiting monitoring, data use, and evidence generation.

Lessons Learned



Sustained engagement across all system levels is key: Early and continuous engagement across national, provincial, district, and health facility levels, aligned with national directives, secured strong institutional buy-in and facilitated effective project implementation



Enhanced multisectoral coordination and community linkages is critical for service delivery: Strengthened coordination between the health and education sectors has proven instrumental in improving vaccine quantification, aligning service delivery with school and community platforms, expanding coverage among eligible girls, and reducing missed opportunities for vaccination.



Strengthened microplanning, resource optimization, and reduction of missed opportunities is crucial: Successful scale-up will require addressing critical system level considerations, including the functional organization of health facilities to systematically capture all vaccination opportunities, integrated microplanning across programs or services, and the strategic alignment and pooling of funding streams

Implications & Recommendations

Findings from this implementation research suggest that integrating HPV vaccination within adolescent health services is operationally feasible, acceptable, and associated with improvements in service utilization and coordination across platforms. While the effect on vaccination uptake was positive but not statistically significant, consistent trends, particularly through school-based delivery and increased use of youth-friendly services indicate that integration can strengthen both access and continuity of care.

Recommendations

- For scale-up, integration should be institutionalized within routine service delivery, embedded in national guidelines, and implemented across schools, health facilities, and community platforms. Schools should remain the primary delivery platform, with strengthened microplanning and coordination between health and education sectors.

- Complementary platforms such as AYFS/SAAJ should be reinforced to reach out-of-school adolescents and ensure continuity of care.

- Scale-up will require investment in basic system enablers, including availability of tools (vaccination cards, registers), adapted data systems, reliable supply chains, and supportive supervision.

- Implementation should be aligned with routine programming cycles to avoid overlap with campaigns or other conflicting activities and maximize reach. Sustained demand generation through community and school actors remains essential to maintain uptake.

Evidence Gaps

- There is limited visibility on which specific services within AYFS/SAAJ drove increased utilization, and insufficient data on reach among out-of-school adolescents.

- While AYFS/SAAJ registers capture multiple services delivered during a single visit, important gaps remain in tracking referral pathways and continuity of care. In particular, the system does not consistently capture the source of referral (e.g., pediatrics, EPI), limiting the ability to assess which platforms are driving service uptake.

Research Questions for Further Investigation

- Further research is needed to assess the impact of integrated delivery over a longer implementation period and outside of campaign contexts, including its effect on vaccination coverage and completion.

- Priority questions include which service components drive utilization under integration, and whether broader adolescent health outcomes improve as a result.

- Additional work is needed to understand equity of reach, particularly among out-of-school adolescents.

- Future research should further examine implementation feasibility, effects on quality of care, and the health system conditions required to support sustainable scale-up.

"From our district experience, integration was positive and feasible. While challenges and constraints exist, they can be overcome. The experience shows it is possible to integrate and scale the approach to improve results."
-District Coordinator