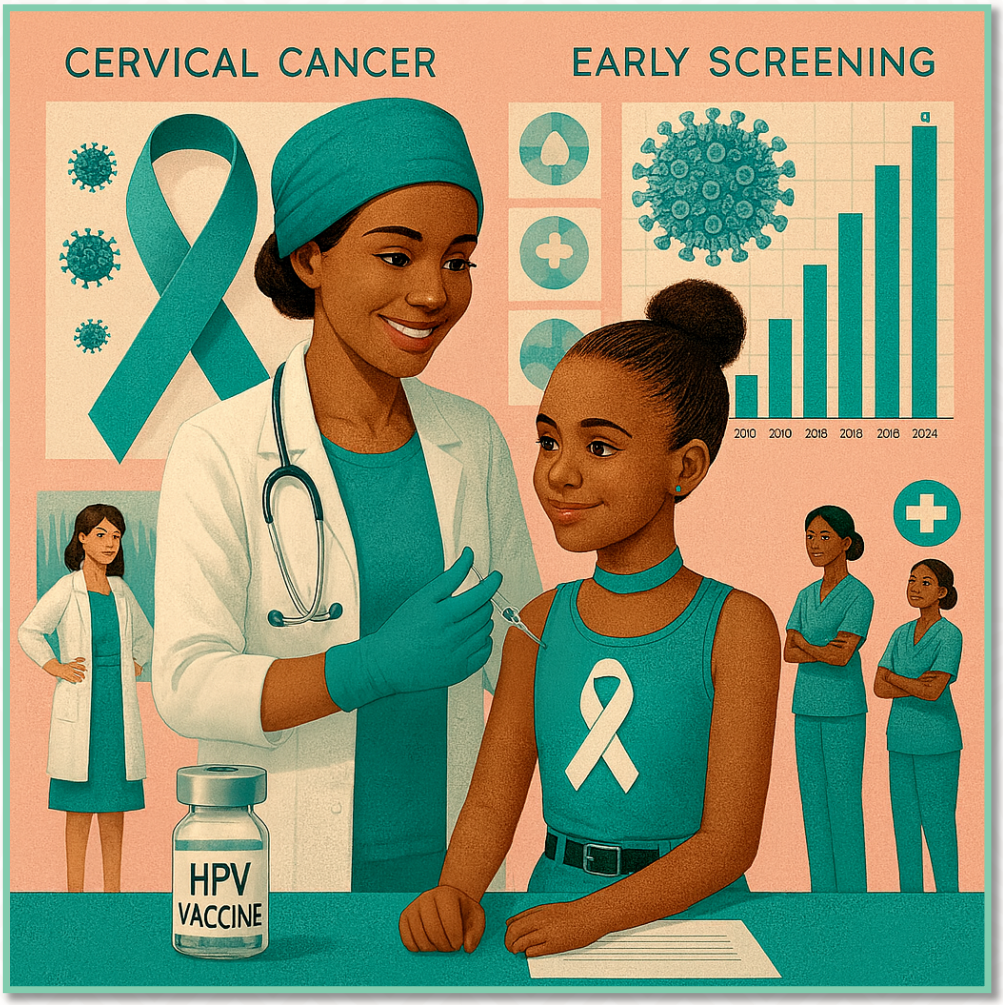
The shot that moves South Africa closer to cervical cancer elimination



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Evidence-based guidance for transitioning to the HPV nonavalent vaccine in South Africa

Executive summary

South Africa has a unique opportunity to accelerate progress toward cervical cancer elimination by upgrading its HPV vaccination strategy. Transitioning to the nonavalent vaccine offers broader protection against high-risk HPV types at a price point that remains within cost-effective thresholds for middle-income countries.

This policy brief translates current South African data and modelling evidence into actionable guidance for aligning HPV vaccination, screening, and treatment with WHO elimination goals.

Why an upgrade in vaccine strategy is needed

Cervical cancer is the leading cause of cancer death among South African women aged 15–44. South Africa's school-based HPV vaccination programme, launched in 2014, The national school-based HPV vaccination programme, launched in 2014, and the tender now open for vaccine procurement will determine future progress toward elimination targets.

Cost-effectiveness modelling indicates that the **nonavalent HPV vaccine** could prevent 85% of cervical cancer cases in South Africa and is cost-effective at ≤ USD 40 per dose and cost-saving at ≤ USD 13.5 per dose — the current UNICEF Supply Division price range (USD 13.5–33.25 per dose).

The quadrivalent vaccine adds genital wart prevention but no incremental cancer prevention, limiting its public health return in South Africa's high-burden context.

Key messages

- The nonavalent vaccine provides additional protection over the bivalent and quadrivalent vaccine (see table).
- South Africa can achieve substantial health and significant cost savings by adopting the nonavalent vaccine at UNICEF Supply Division prices.
- The bivalent vaccine remains cost-saving until nonavalent contracts are secured.
- Even at 90 % coverage, vaccination alone won't allow South Africa to reach the WHO elimination threshold; screening and treatment scale-up remain essential.

Vaccine	High-risk coverage	Estimated cervical cancer coverage	Genital wart coverage	Cancer prevention impact
BIVALENT	✓✓ (16,18 + significant protection against 31, 45)	>65%	✗	Strong cancer prevention
QUADRIVALENT	✓ (16,18)	65%	✓ (6,11)	No additional cancer prevention gain
NONAVALENT	✓✓✓ (16,18, 31,33,45,52,58)	85%	✓ (6,11)	Broadest protection, best elimination pathway

Background

HPV in South Africa

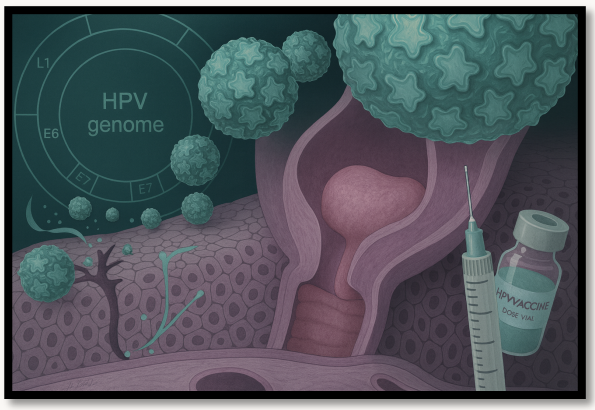
Human papillomavirus (HPV) is a common infection, and almost everyone will be exposed during their lifetime. In most cases, the immune system clears the virus naturally without disease, but persistent infection with high-risk types can lead to cervical cancer.

South Africa has one of the world's highest cervical cancer incidence rates, and the disease remains the leading cause of cancer deaths among women aged 15–44. Women living with HIV are about six times more likely to develop cervical cancer because of reduced viral clearance and higher persistence.[1]

Local evidence

Globally, around 13 HPV types are considered high-risk for cancer. In South Africa, HPV-16 and -18 (covered by the bivalent vaccine) cause about **65 %** of cervical cancer cases[2,3,6] but other high-risk types — HPV-31, -33, -45, -52, and -58 — are also common, together accounting for **70–80 %** of CIN2+ lesions.[4–6] HPV-35, not included in any current vaccine, contributes to about **10 %** of cancers, compared to 2 % globally.[2,3,6] South African studies show higher infection prevalence among women living with HIV — exceeding **90 %** in some cohorts — with multiple high-risk co-infections frequently observed.[5]

Collectively, these data highlight substantial gaps *with the current bivalent vaccine and the importance of aligning national vaccination strategy with local HPV genotype distribution.*



Why now

With active tenders for vaccine procurement, South Africa has a time-sensitive opportunity to expand HPV protection through nonavalent vaccine adoption - maintaining the bivalent programme until procurement contracts are finalised.

Broader cancer and disease burden

High-risk HPV types are also linked to multiple other cancers—including **anal (88%)**, **vaginal (70%)**, **vulvar (50%)**, **penile (47%)**, and **head and neck cancers (26%)**—beyond cervical disease.[7] South Africa has seen a **9.3% increase in anal cancer** and a **6.9% increase in penile cancer incidence** between 2011 and 2021, highlighting the growing burden of non-cervical HPV-related cancers.[8]

Low-risk HPV types -**6 and -11**, which cause most genital warts, are not covered by the current bivalent vaccine. Although genital warts are not life-threatening, they cause substantial psychosocial distress and generate avoidable healthcare costs.[9–11]

Need for vaccine transition

Both the bivalent and quadrivalent vaccines have reduced HPV infections and precancerous lesions. However, the **bivalent** vaccine targets only two high-risk types, and the **quadrivalent** vaccine, while adding low-risk HPV-6/11 protection, offers no additional cancer prevention and reduced efficacy against key oncogenic types.

The **nonavalent** vaccine covers seven high-risk types (-16, -18, -31, -33, -45, -52, -58) offering approximately **85 %** protection against cervical cancer[2,4,6] and two low-risk types (-6, -11), giving additional prevention of genital warts and other HPV-related malignancies. This broader protection better matches South Africa's HPV genotype profile and public-health priorities.

Evidence from cost-effectiveness analyses

Bivalent vaccine is cost-saving

At the current cost (about USD 9 per dose), the girls-only bivalent vaccination is cost-saving compared to no vaccination. School-based delivery and expansion through primary care platforms or catch-up campaigns for older girls also remain cost-saving strategies.

Even at 90 % coverage, vaccination alone won't allow South Africa to reach the WHO elimination threshold; screening and treatment scale-up remain essential.

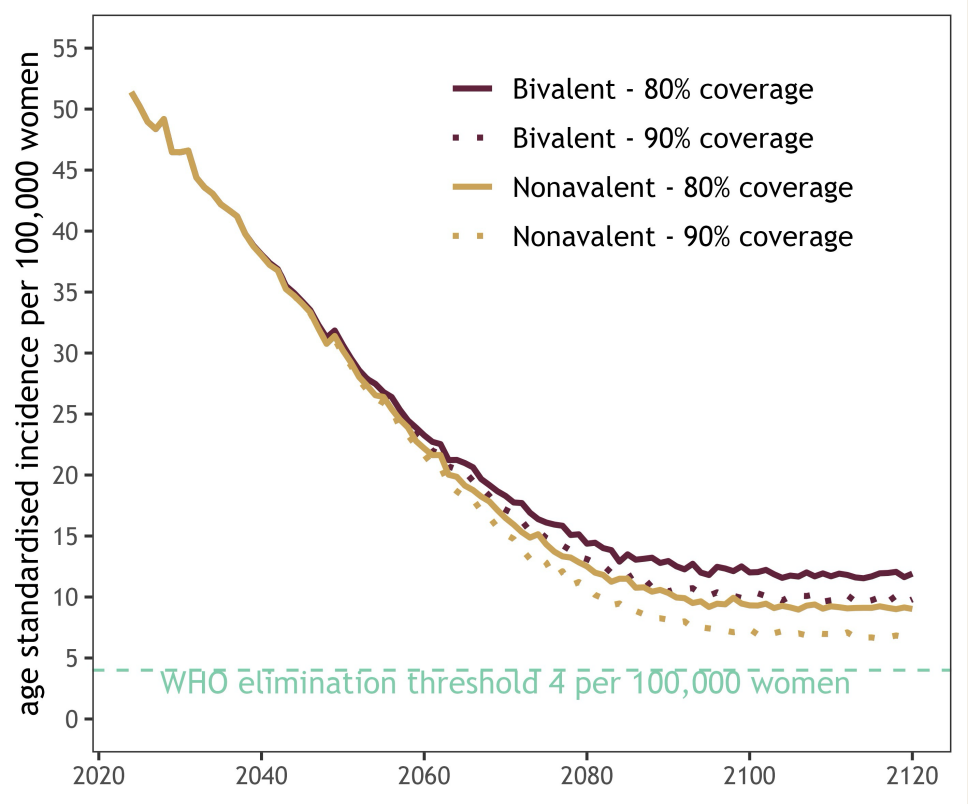
Nonavalent vaccine expands protection and maximises public health ROI

The nonavalent vaccine prevents about 85% of cervical cancer cases and additionally reduces genital warts.

While the private-sector price (about USD 129 per dose) is unaffordable for the public sector, analyses show that the nonavalent vaccine is cost-effective in South Africa at ≤ USD 40 per dose, and cost-saving at ≤ USD 13.5 per dose.

The UNICEF Supply Division price range (USD 13.5–33.25) meets these thresholds, thus the nonavalent vaccine provides the greatest health return per dose, with both cancer and genital wart prevention benefits.

Projected decline in cervical cancer incidence under bivalent and nonavalent HPV vaccination scenarios in South Africa.



The current bivalent programme, with expanded coverage to 90%, will reduce cervical cancer incidence by approximately 65% by 2120, but will not achieve the WHO cervical cancer elimination threshold of 4 cases per 100,000 women.

Transitioning to the nonavalent vaccine accelerates progress and achieves markedly lower residual incidence at both 80% and 90% coverage.

Source: van Schalkwyk *et al.*, 2025

Data and cost-effectiveness modelling from the VaxCEA study (van Schalkwyk *et al.*, 2025).
Pricing from UNICEF Supply Division (2025).

Complementary vaccination strategies to strengthen impact

In addition to routine vaccination among adolescent girls, focused and catch-up approaches can accelerate progress toward elimination and address key equity gaps.

Vaccination for women living with HIV (WLHIV)

10%

Additional cervical cancer cases prevented among WLHIV.[12]

WLHIV remain around six times more likely to develop cervical cancer.[1] Delivering the nonavalent vaccine to this group, through antiretroviral therapy (ART) clinics, maternal health services, or cervical screening programmes, would be cost-saving and can close a critical equity gap and yield high marginal benefit in the near-term.

Catch-up vaccination for adolescent girls (ages 10-18)

5%

Additional cervical cancer cases prevented among all women.[12]

Extending vaccination to girls that missed earlier doses can rapidly increase population immunity and reduce cervical cancer incidence in the medium term. Modelling indicates that 5-yearly high-school based catch-up campaigns or continuous access to vaccination at primary health clinics provides a greater health gain per dose than any broader programme expansion.[12]

Vaccination for all children and men who have sex with men

5%

Additional cervical cancer cases prevented among all women.[12]

Vaccinating **10-year-old boys** in the school-based programme with the bivalent vaccine could prevent around 5% more cervical cancer cases than girls-only vaccination, further accelerating progress toward elimination targets.

Considering the rising burden of other HPV-related cancers in South Africa, where between 2011-2021, there was a **9.3% increase in anal cancer incidence** and a **6.9% increase in penile cancer incidence,** there is a critical need to extend protection beyond cervical cancer.[8]

At the current bivalent vaccine price, a gender-neutral strategy yields a median incremental cost-effectiveness ratio (ICER) of USD 2 800 per disability-adjusted life year (DALY) averted**,** remaining below the national opportunity-cost threshold of USD 3 015**.**[12]

9.3%

increase in anal cancer incidence between 2011 and 2021.[8]

Men who have sex with men face elevated risk of anal, penile, and oropharyngeal HPV-related cancers and do not benefit from herd protection achieved through girls-only vaccination. Offering vaccination through sexual health or HIV prevention services would complement equity objectives but should remain a targeted initiative rather than a national procurement priority.

Data and cost-effectiveness modelling from the VaxCEA study (van Schalkwyk *et al.*, 2025).
Pricing from UNICEF Supply Division (2025).

Recommendations

The time to switch to the nonavalent vaccine is **NOW**.

For the National Department of Health

- Procure the nonavalent HPV vaccine at current UNICEF Supply Division's middle-income country prices (USD 13.5–33.25 per dose) → these fall within the cost-effectiveness threshold and are thus a good investment of South African health budget.
- Adopt the nonavalent HPV vaccine through national policy revision and strategic plan updates, ensuring alignment with WHO cervical cancer elimination targets.
- Extend vaccination to cohorts (girls aged 15–18) that missed earlier doses through high-school based catch-up campaigns or continuous access to vaccination at primary health clinics to rapidly increase population immunity and reduce cervical cancer incidence.
- Prioritise vaccination for women living with HIV via ART clinics, maternal health, and screening services to close equity gaps and reduce near-term incidence.
- Develop a targeted vaccination pilot for men who have sex with men through sexual health and HIV prevention services to address residual high-risk burden.
- Consider gender-neutral vaccination, i.e. vaccination of both boys and girls as a phased, future expansion, for its incremental impact on other HPV-related cancers.
- Scale up cervical screening and early treatment in parallel with vaccination to accelerate elimination progress.
- Integrate vaccination, screening, and treatment into a comprehensive elimination strategy within the National Cancer Control Plan.
- Strengthen routine data systems to track single-dose coverage, equity of reach, and subnational progress toward elimination thresholds.
- Implement culturally informed, community-led campaigns emphasising the broader cancer-prevention benefits of HPV vaccination.
- Strengthen health-worker and educator training to improve communication on the single-dose schedule, eligibility, and long-term protection.

For the National Treasury

- Allocate funding for enhanced vaccination, screening, and treatment for a comprehensive cervical cancer elimination strategy, based on cost-effectiveness evidence showing that nonavalent vaccination will reduce cervical cancer treatment costs in the long term.

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With the shift to a single-dose HPV vaccination schedule and increasing evidence of diverse oncogenic HPV type circulation, sustaining and strengthening the gains of the national programme is critical.

The nonavalent vaccine provides broader cancer prevention and long-term cost savings within the current procurement price range.

However, even at 90% coverage, vaccination alone will not enable South Africa to reach the WHO cervical cancer elimination threshold; expanding screening and treatment remains essential.

Now is the time for South Africa to transition to the nonavalent vaccine and rethink its elimination strategy — protecting the next generation from preventable cancers and consolidating the progress already achieved.

Issued by the Cancer Alliance, in collaboration with the South African Centre for Epidemiological Modelling and Analysis (SACEMA), Stellenbosch University; University of KwaZulu-Natal; Columbia University; University of Cape Town; National Cancer Registry.

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