

The future of HPV vaccination in South Africa

The Cervical Cancer Elimination Webinar Series

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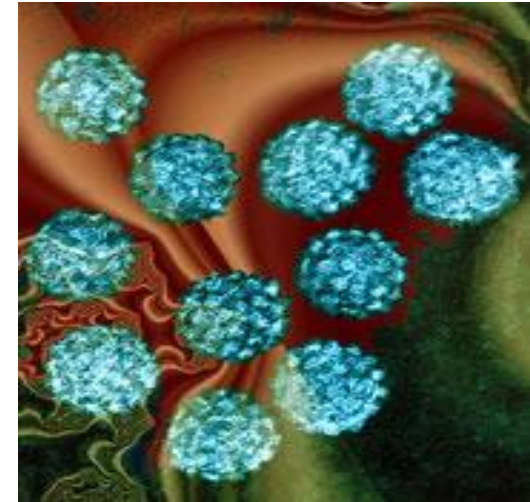
Board Chair of International Vaccine Institute

Board Chair MedAccess

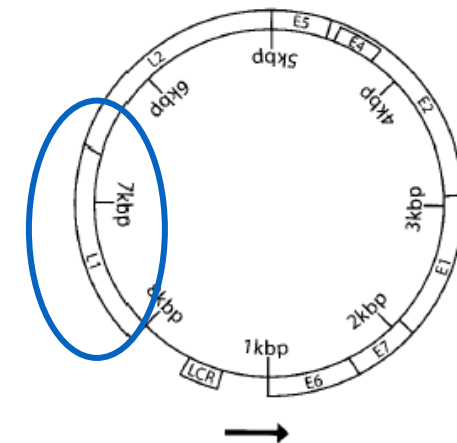
Honorary Professor LSHTM and Honorary Fellow Muraay Edwards College, Cambridge University

Human Papillomaviruses

- Circular double-stranded DNA genome
 - 2 capsid proteins (L1, L2)
 - 3 oncogenes (E5, E6 and E7) modulate the transformation process
- Type classification based on L1
 - 100 genotypes, 40 genital, 12 linked to cancer



Low-risk	HPV 6, 11 , 40, 42, 43, 44, 54, 61, 70, 72	Anogenital warts
High-risk	HPV 16, 18 , 31, 33, 35, 39, 45, 51, 52, 56, 58, 59	Cervical cancer Anal, penile, vulva, vagina and oropharyngeal cancer



HPV Infection

- Most common sexually transmitted infection
- Global prevalence 11 - 12%
- Infection associated with age in women
- Most common types 16, 18, 52, 31, 58
- Prevalence of genital HPV infection in men > women, but persistence less likely.
- Few studies have evaluated genital HPV prevalence by anatomic site.
 - Among men, HPV prevalence is highest at penis and lowest at urethra.
 - Among women, HPV prevalence is highest at cervix and vagina and lower at vulvar epithelium [8,11].
- Anal HPV infection is frequently detected in both sexes, with differences by gender and sexual orientation.
- Anal HPV prevalence among MSM (58.8%) twice that among women (30.7%),

HPV Prevalence - Global

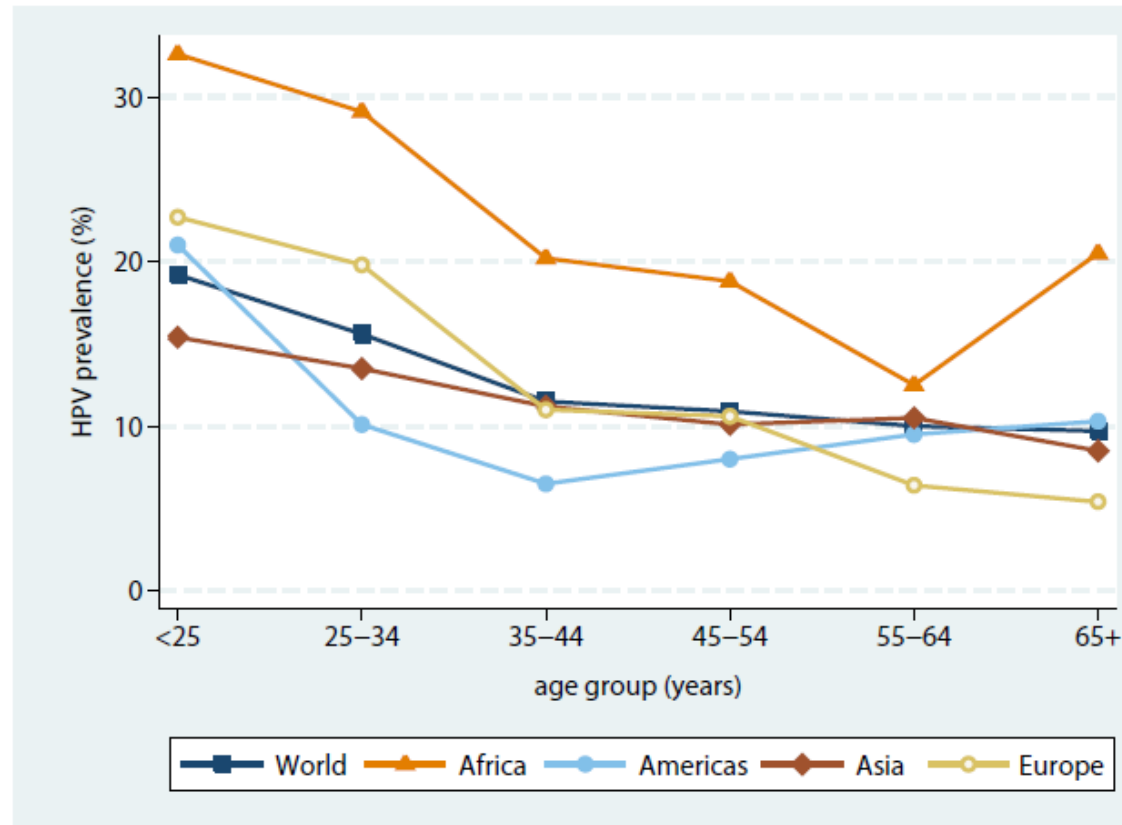
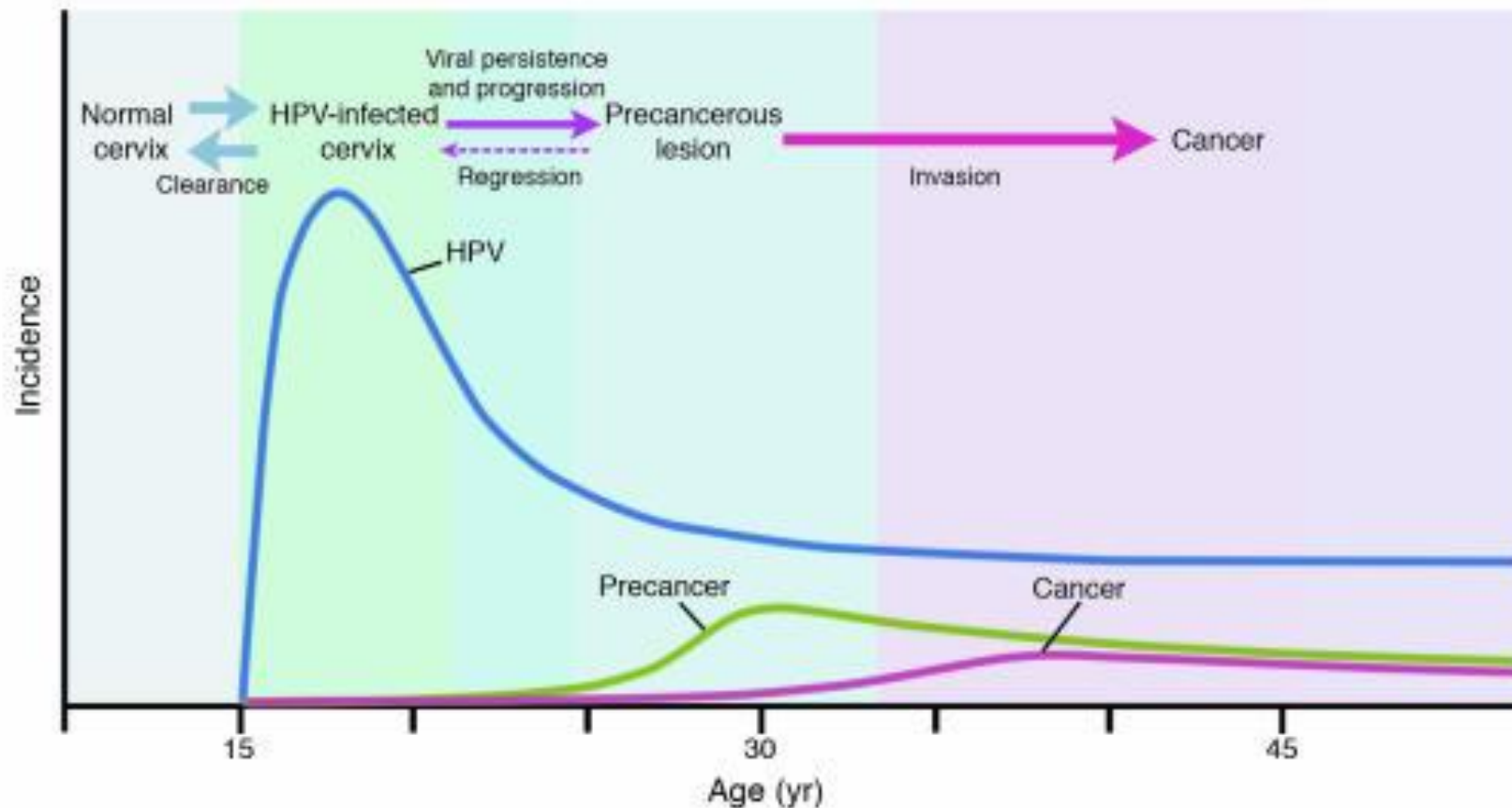


Fig. 1. Crude age-specific HPV prevalence (%) in women with normal cervical cytology in the world and its regions. HPV: Human papillomavirus. Adapted from *Bruni et al., J Infect Dis 2010 [9]*.

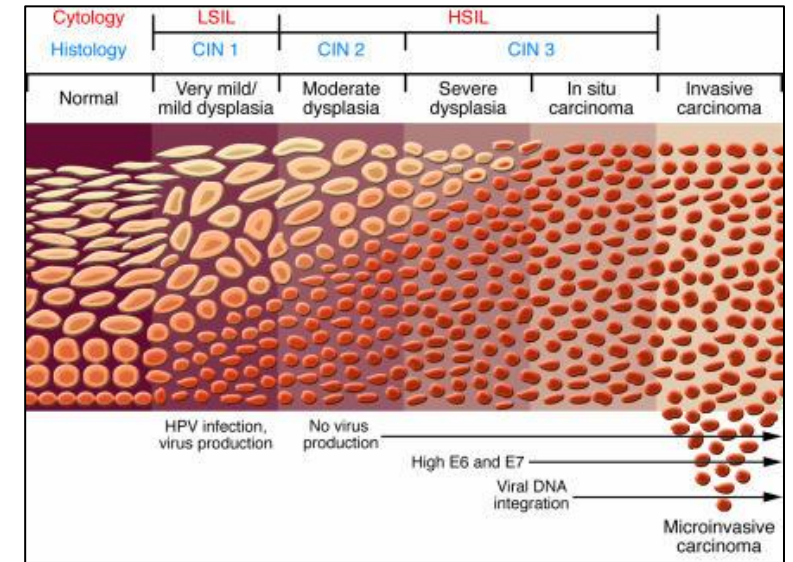
Relationship between incidence of HPV infection, pre-cancer and cancer



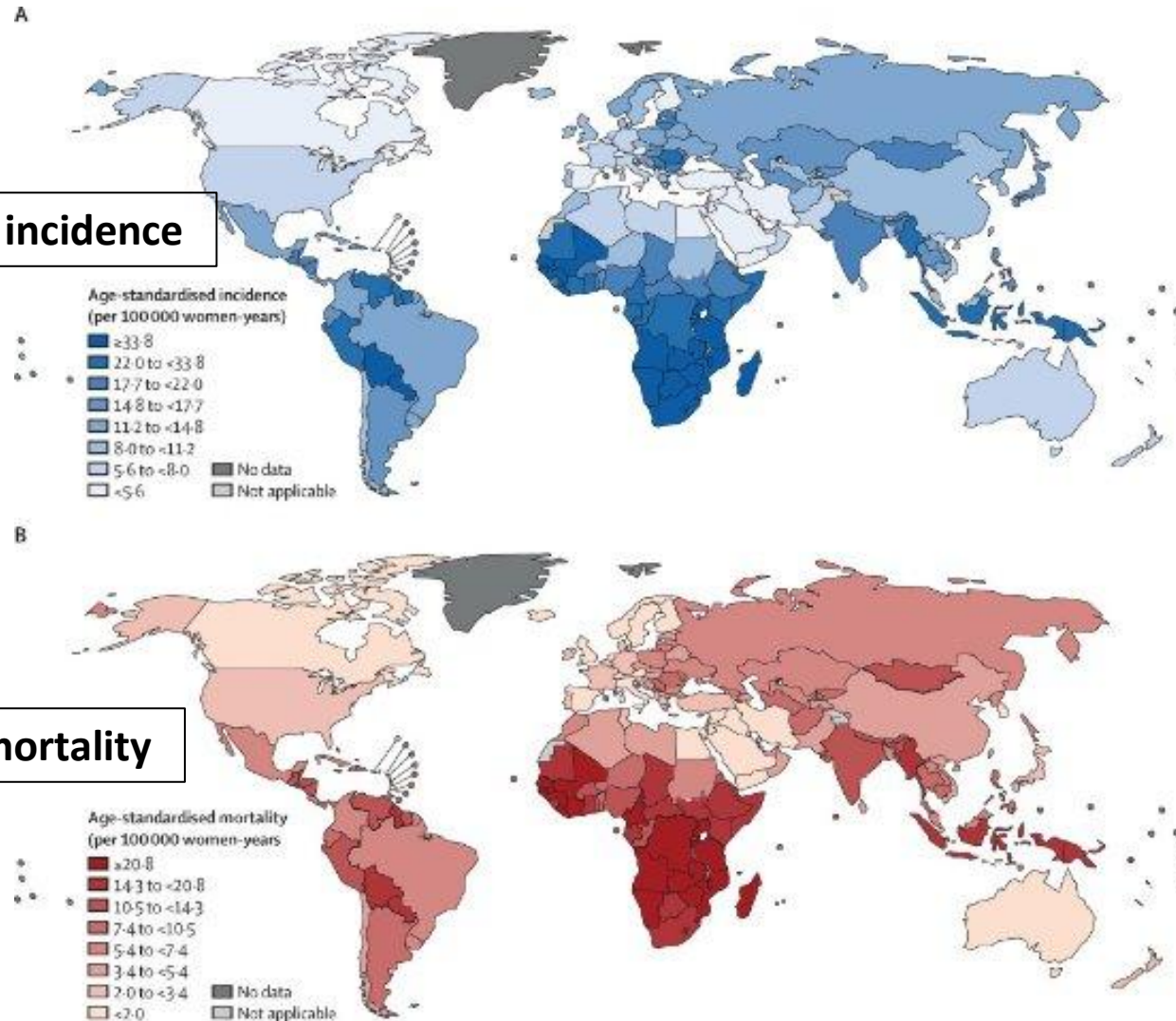
Source: Lowy, J Clinical Invest, 2006

Relationship between incidence of HPV infection, pre-cancer and cancer

- Majority of HPV infections in young women are transient (duration ~4 -8 months)
- Around 10-20% of infected women develop persistent infection
- Only women who develop persistent infections are at risk for developing CIN 2/3 & invasive cervical cancer
 - 50% will develop CIN2/3 within 3 years
 - 20% of CIN 2/3 will progress to cancer within 5 years
 - 30% within 10 years, 40% within 40 years
- As women approach 40 years of age, incidence of cancer begins to approach incidence of precancer

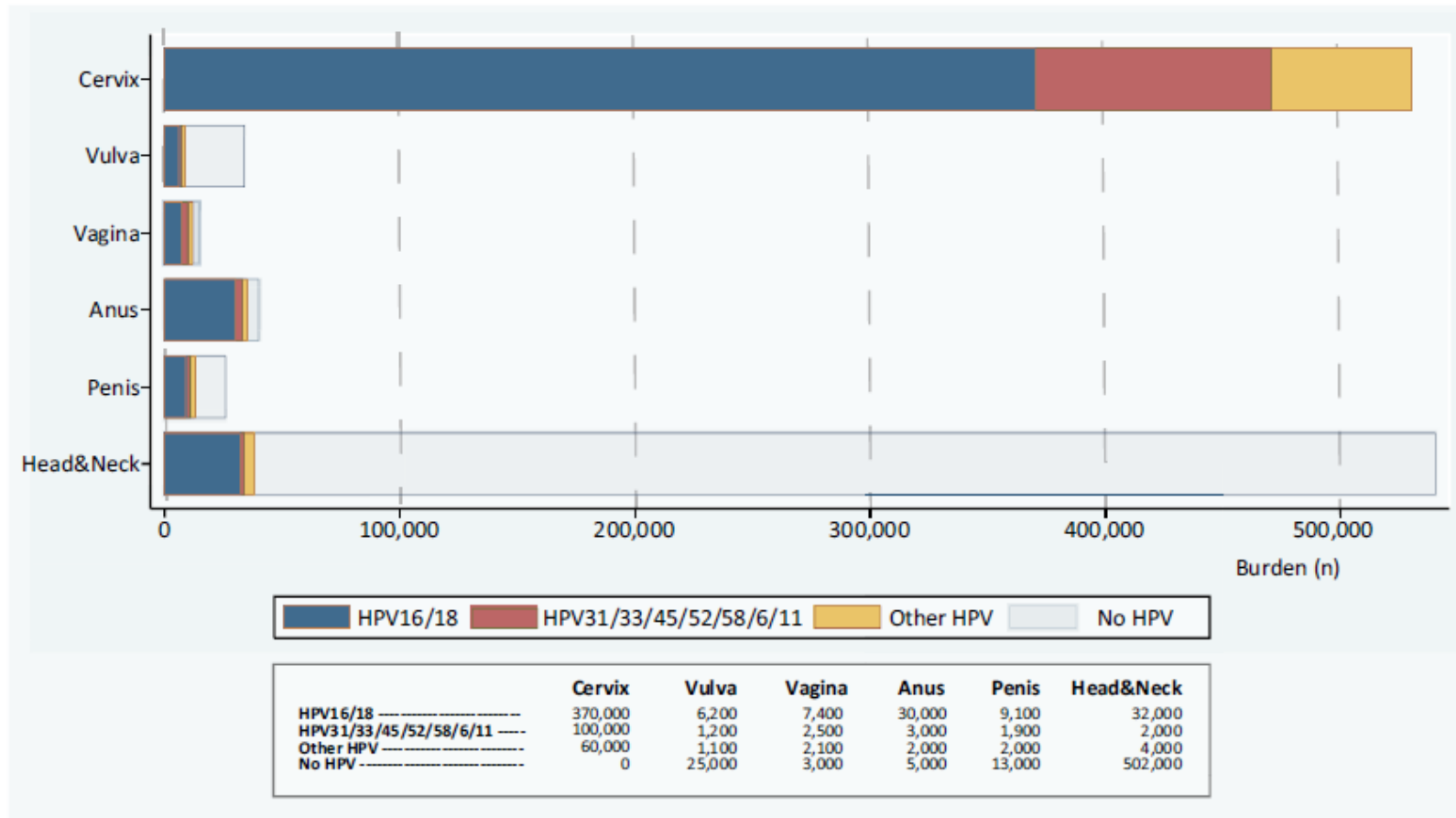


Cervical Cancer Mortality - Worldwide



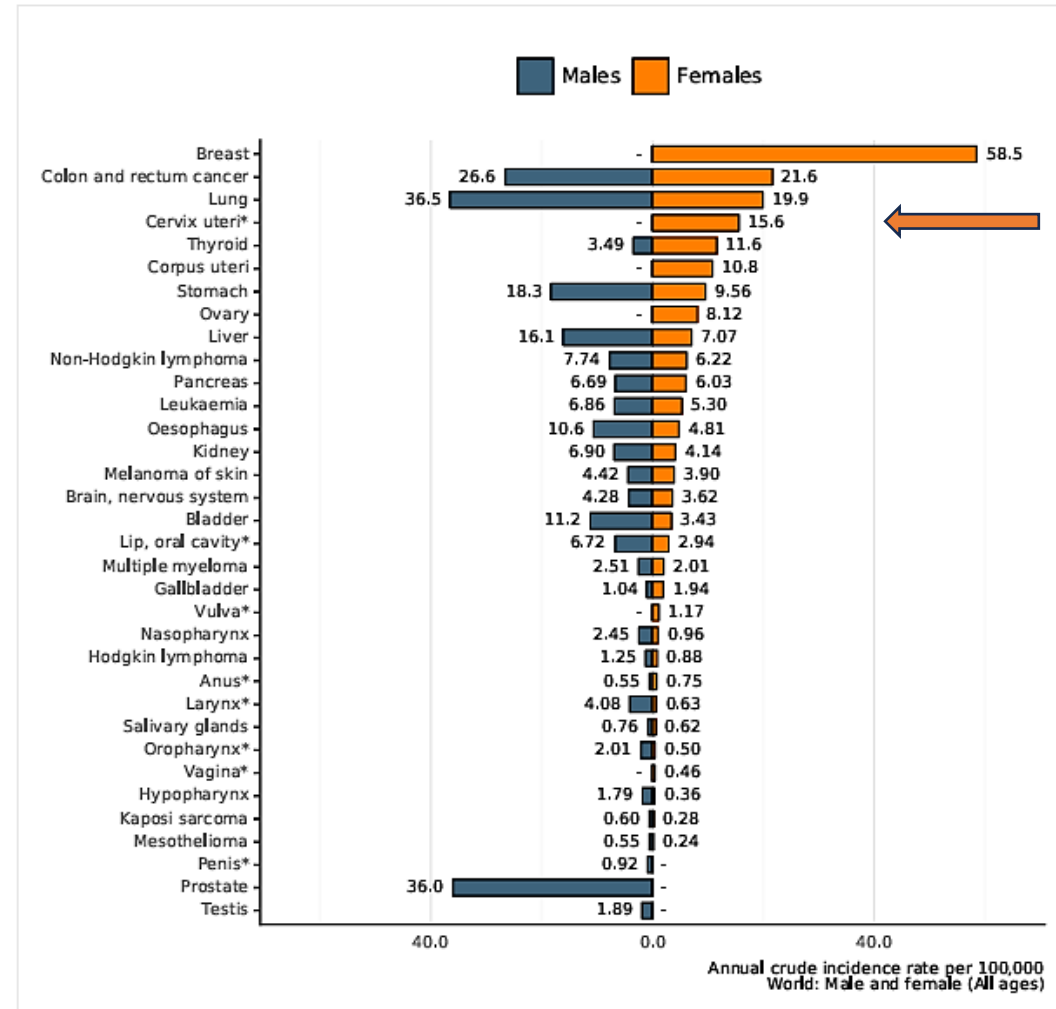
Burden of HPV-related cancer cases by site and type

70% cervical cancer cases caused by type 16, 18



Global Cancer Incidence

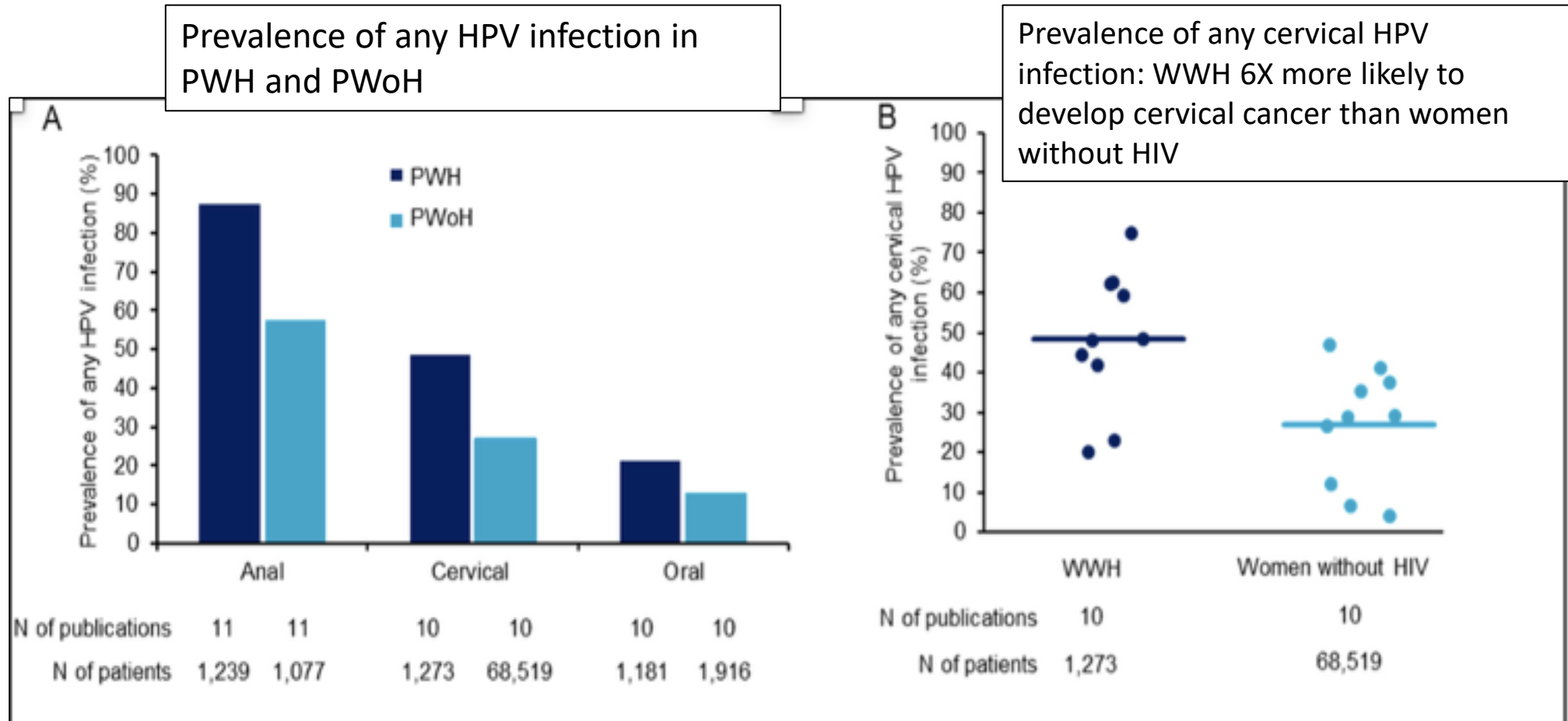
Figure 5: Comparison of HPV related cancers incidence to other cancers in men and women of all ages in the World (estimates for 2020)



Data accessed on 27 Jan 2021

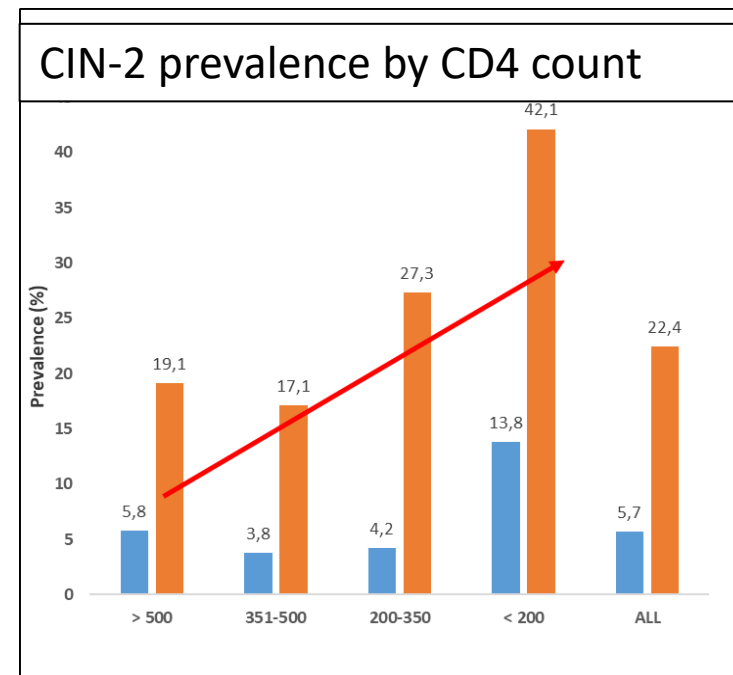
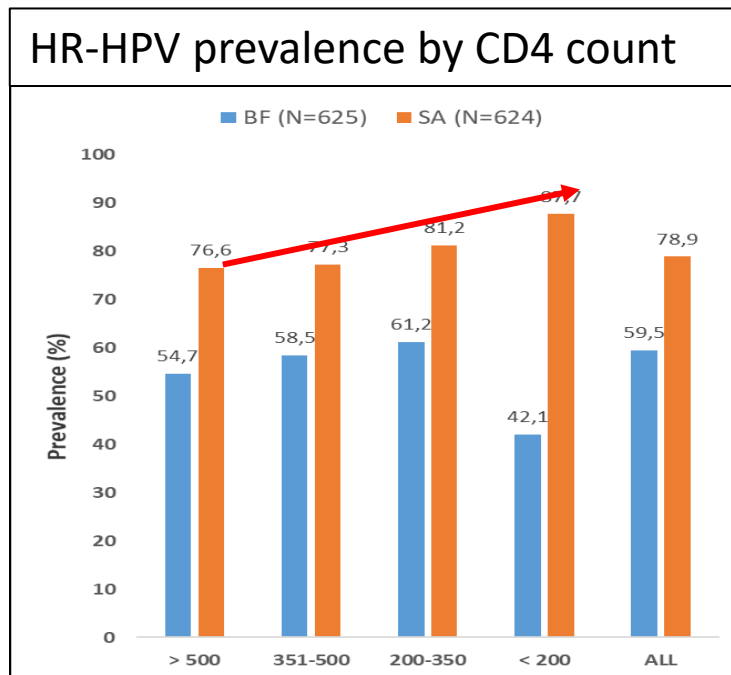
ICO/IARC HPV Information
Centre, Human
Papillomavirus and Related
Diseases Report, March
2023

The Burden of HPV Infections and HPV-Related Diseases Among People With HIV



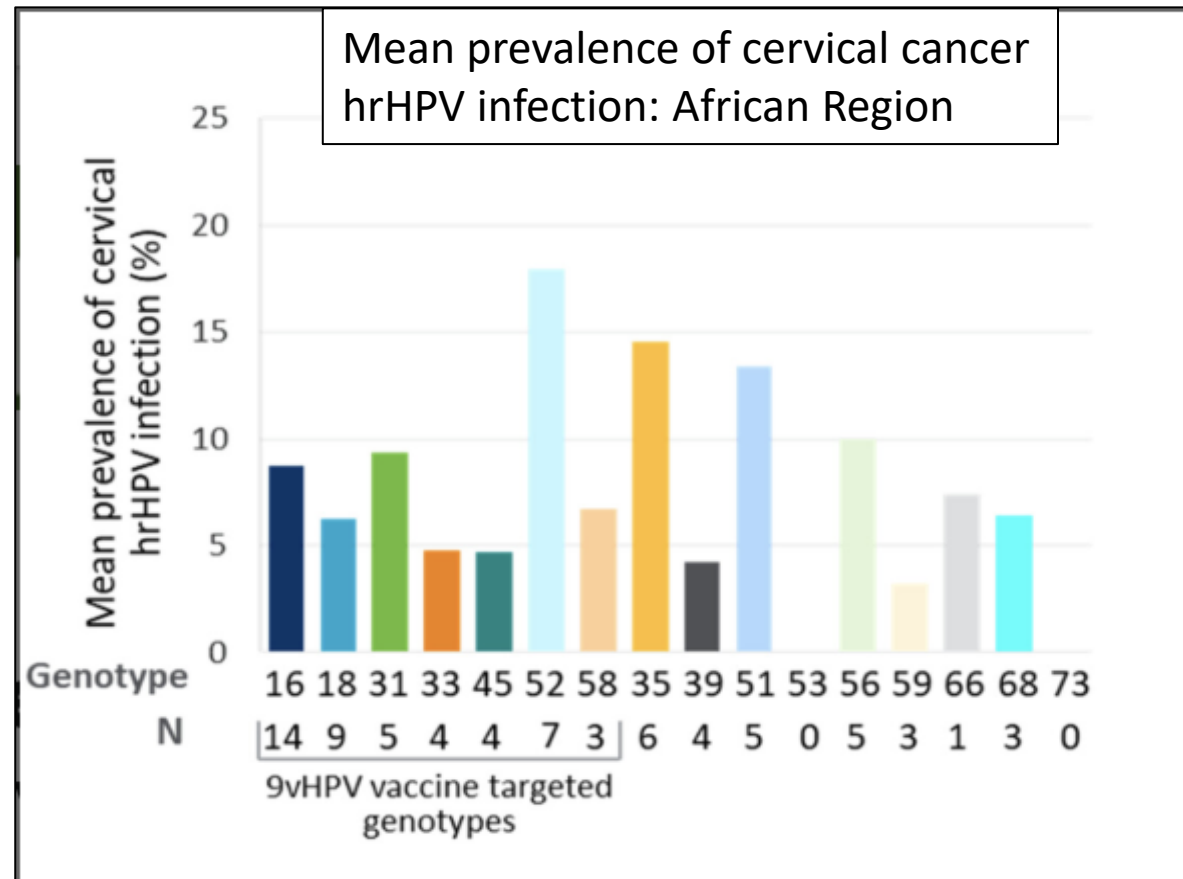
HPV Associated Disease in PLWH

- 1200 WLH in SA & Burkina Faso, 2/3 on ART
- HR-HPV prevalence 59-79%, LR HPV 27-41%
- CIN2+ prevalence 5.8-22.5%, incidence 1.2-5.8% over 16 months



The Burden of HPV Infections and HPV-Related Diseases Among People With HIV: Cervical Cancer

A Systematic Literature Review



WHO's Cervical Cancer 90-70-90 Elimination Initiative

Target	WHO Cervical Cancer Elimination Initiative (CCEI)
Overall goal	Eliminate cervical cancer as a public health problem
90% – Vaccination	90% of girls fully vaccinated against HPV by age 15
70% – Screening	70% of women screened with a high-performance test by age 35, and again by age 45
90% – Treatment	90% of women with precancer receive treatment
90% – Cancer management	90% of women with invasive cervical cancer appropriately managed
Elimination threshold	Reduce cervical cancer incidence to <4 cases per 100,000 women per year
Overall goal	Eliminate cervical cancer as a public-health problem

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WHO Position Paper on HPV Vaccines, Dec 2022

Primary target: girls 9 to 14 years of age

2-dose schedule for all ages* starting from 9 years old

Option: 1-dose schedule for 9 to 20-year-olds*

Prioritize: – Immunocompromised/HIV+ and children and adolescents who have faced sexual abuse.
– Immunocompromised/HIV+ schedule: 2 doses, ideally 3
– Multi-Age-Catchup 9 through 18 years at introduction

Secondary Targets: boys & older women/adults ≥15 yr if feasible & affordable and doesn't divert resources from vaccination of the primary target population or effective cervical cancer screening programmes.

SAGE recommended WHO to consider developing a prioritization framework for the secondary target populations



SA's Cervical Cancer Elimination Framework, 2026

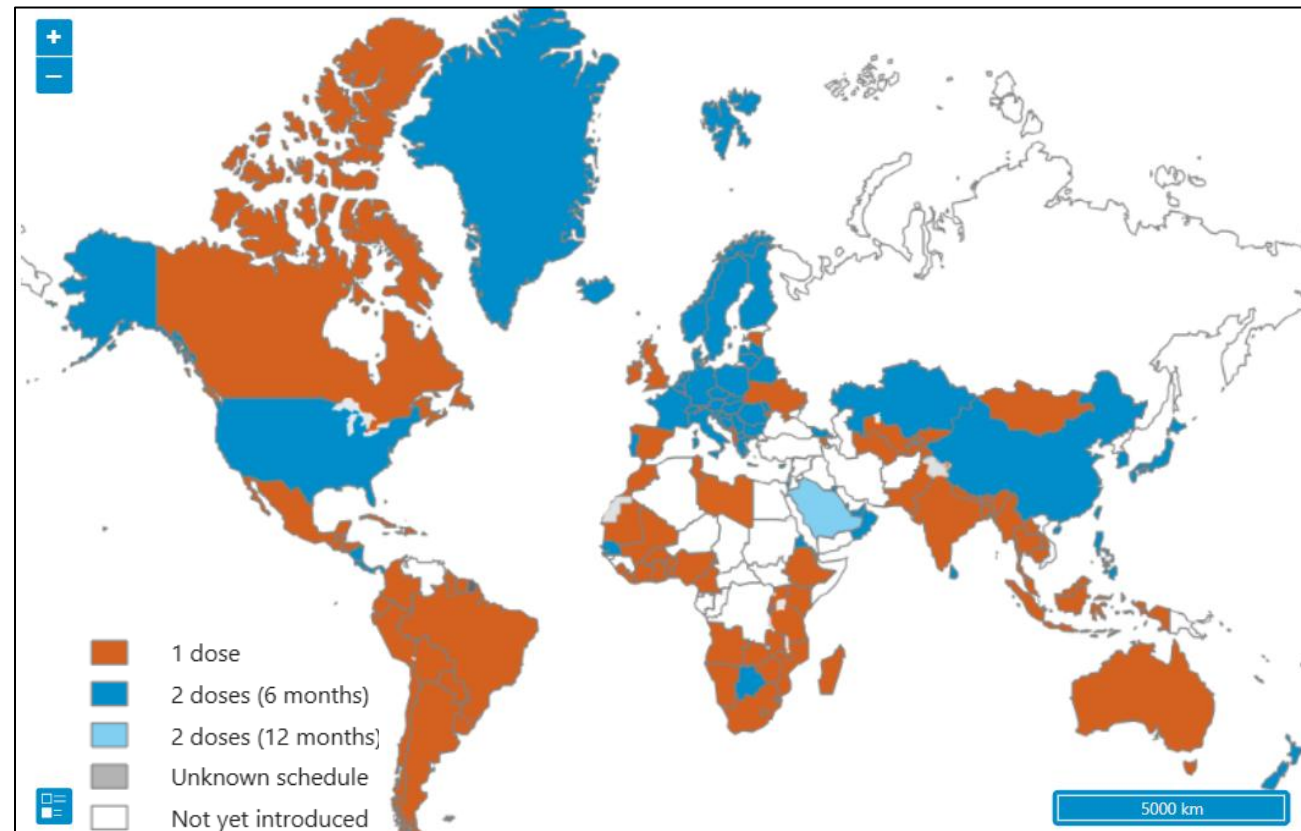
Target	WHO 90–70–90	South Africa 2026–2030 strategy
Overall goal	Cervical cancer incidence <4/100,000 women/year	Same elimination goal; aligned with WHO
90% – HPV vaccination	90% girls fully vaccinated by age 15	90% girls vaccinated by age 15
Vaccination approach	HPV vaccination	Single-dose strategy; girls 9–15 years, strengthened school programme + catch-up + out-of-school girls
70% – Screening	70% screened with a high-performance test by 35 and 45 years	70% screened with high-performance testing, but SA framework operationalises screening across ages 25–55
Screening test	High-performance HPV-based test	Transition to HPV DNA testing as the primary screening test
Women living with HIV	Recognised as a high-risk population	Explicit priority because of SA's high HIV burden; screening integrated with HIV/primary-care services
90% – Precancer	90% of women with precancer treated	Same; decentralisation of precancer treatment, including thermal ablation
90% – Invasive cancer	90% appropriately managed	Same; expansion/decentralisation of oncology services
Implementation	Global framework	SA implementation in phases: acceleration 2026–28 → stabilisation 2028/29 → sustainability 2029/30

Single-dose Adoption: 93 countries (WHO, June 2026)

Out of 165
countries that
introduced HPV
vaccine

93 countries
(57%) use single
dose

HPV vaccination programme schedule (9-14 years old)



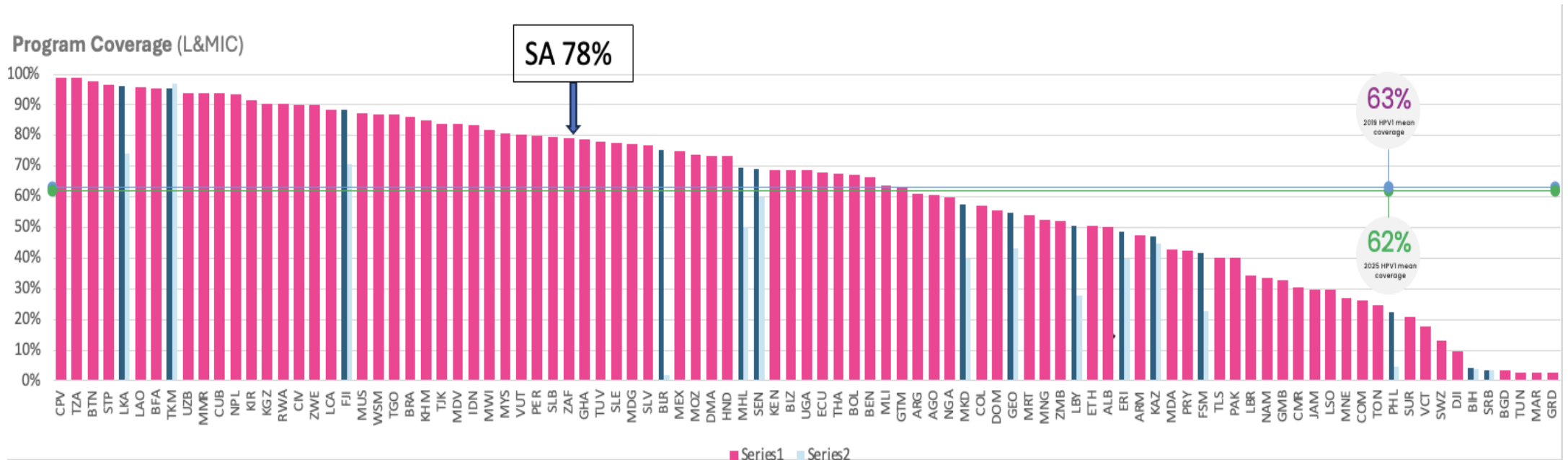
By end 2025,
>80% of all
WHO Members
introduced HPV
vaccine

Countries offering HPV vaccines to girls only or boys & girls



WHO/UNICEF Estimates of HPV coverage in 2025

- ❑ In HICs mean HPV1 coverage rate has stagnated below pre-pandemic levels at 63%.
- ❑ Mean HPV1 coverage in L&MIC has stabilized at 62% in 2025, a near recovery from pre-pandemic level.



HPV vaccines – Overview of Licensed Products (2026)

Merck/MSD Gardasil 4v & 9v	<u>Licensed globally / WHO prequalified</u> Adjuvant: Alum Sched.: 2 doses (9-14yo) or 3 doses (15+ yo) Pres.: 1 dose vial (PQ) / PFS (non PQ) 2dose vial (non PQ)	1-Dose VE data
GSK Cervarix 2v	<u>Licensed globally / WHO prequalified</u> Adjuvant: AS04 Sched.: 2 doses (9-14yo) or 3 doses (15+ yo) Pres.: 1,2 dose vial (PQ)/ PFS (non PQ)	1-Dose VE data
Xiamen Innovax (Beijing Wantai) Cecolin 2v	<u>Licensed in China / WHO prequalified</u> Adjuvant: Alum Schedule: 2 doses (girls 9-14yo) or 3 doses (women 15-45) Presentation: 1 dose vial / PFS	1-Dose VE data
Shanghai Zerun (Yunnan Walvax) Walrinvax/Wo Ze Hui 2v	<u>Licensed in China / WHO prequalified</u> Adjuvant: Alum Schedule: 2 doses (girls 9-14yo) or 3 doses (women 15-30yo) Presentation: 1 dose vial	
Serum Institute of India – SII Under PQ review Cervavac 4v	<u>Licensed in India (March 2023)</u> Adjuvant: Alum Schedule: 2 doses (9-14yo) or 3 doses (15-26 yo) Presentation: tbc	1- dose Trial ongoing
Xiamen Innovax (Beijing Wantai) Cecolin 9v Under PQ review	<u>Licensed in China (June 2025)</u> Adjuvant: Alum Schedule: 2 doses (girls 9-14) or 3 doses (women 15-45) Presentation: tbc	1- dose Trial ongoing
Nanolek LLC (NPK Combiotech, Russian Federation) Tsegardex 4v	<u>Licensed in Russia (March 2025)</u> Adjuvant: Alum Schedule: 3 doses (18-45)	Immunobridging to 9-17 yr old ongoing

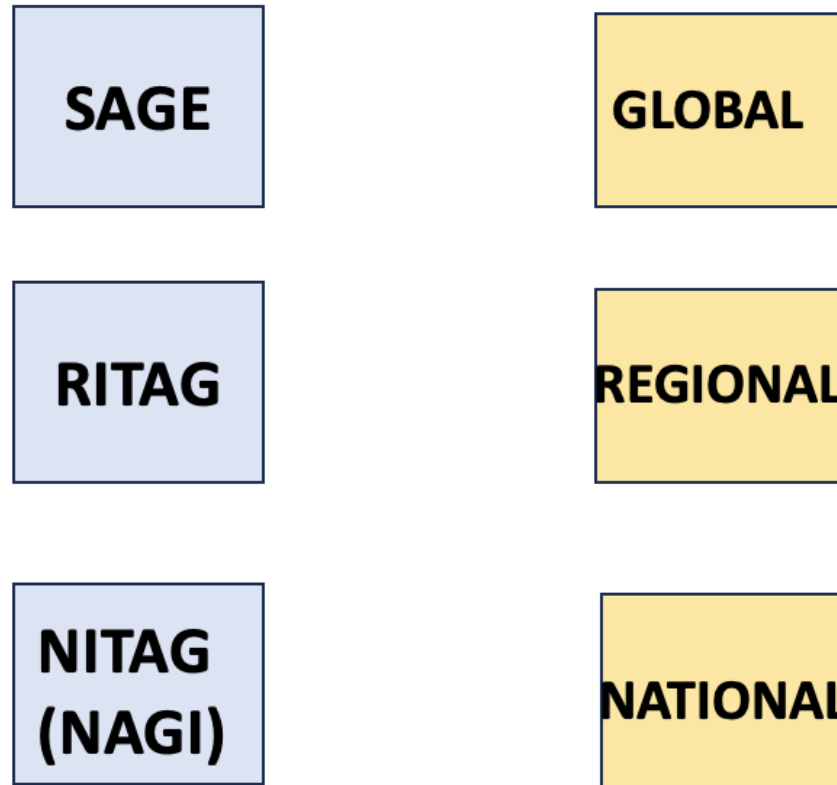


Considerations for Human Papillomavirus (HPV) Vaccine Product Choice

Second edition



Review by the WHO Strategic Advisory Group of Experts on Immunisation (SAGE), October 2026



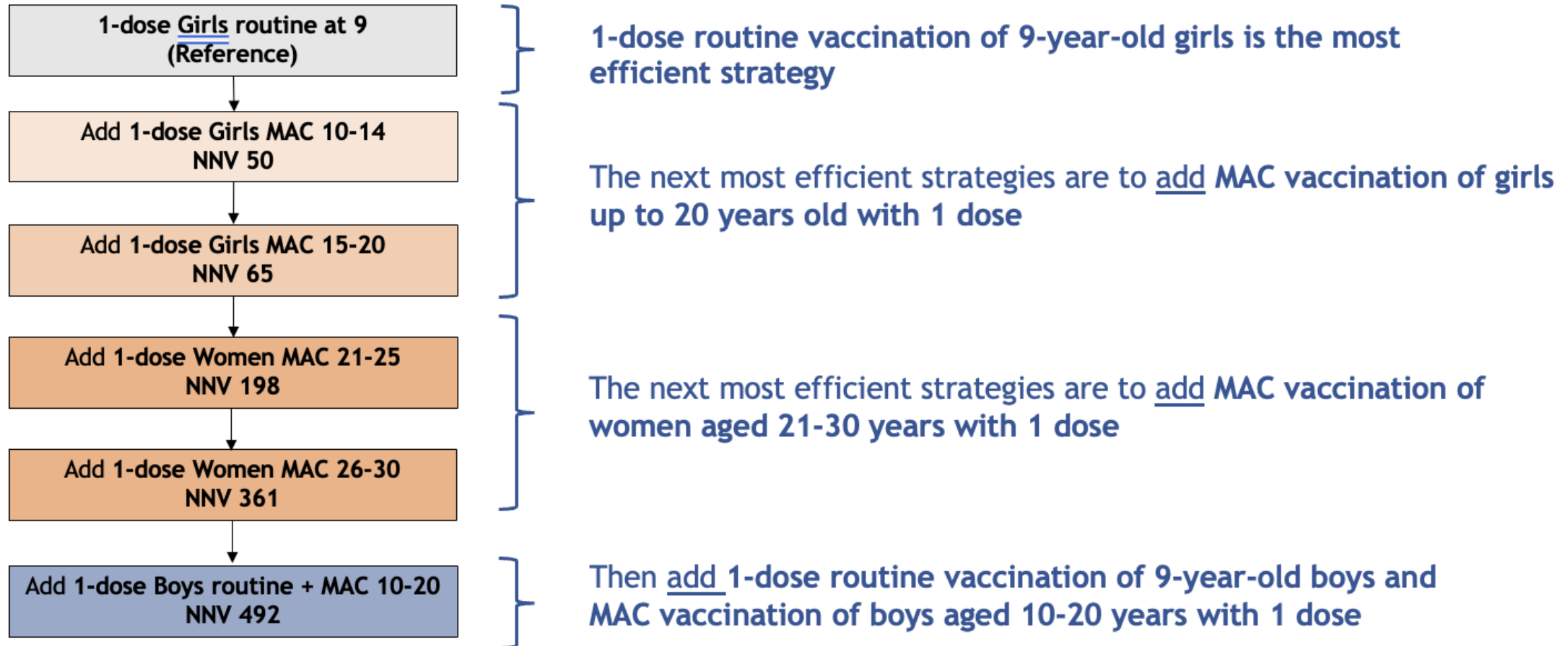
Questions for WHO Strategic Advisory Group of Experts on Immunisation (SAGE), October 2026

- What is the state of evidence on single-dose HPV vaccine schedules and would this be the basis for SAGE to “strengthen” the current, *alternative* and *off label* 1-dose schedule recommendation
- Is the evidence for 1-dose use in 9-20 yr olds strong enough to warrant a universal 1-dose recommendation in this age bracket?
- Is there sufficient evidence to consider use of 1 dose at ages below 9yr?
- Is there sufficient evidence to extend the use of alternative 1 dose use beyond 20 years of age?
- Is there new evidence for use of 1-dose in males
- Is there new evidence to reconsider schedules for immuno-compromised individuals - including individual that received 1-dose vaccination prior to HIV infection?
- What is the evidence for use of HPV vaccine in
 - Preventions of recurrence of infection following treatment of high-grade pre-cancer lesions
 - Women testing negative for HPV 16 or 18 in routine screening

HPV-ADVISE - Global analysis (67 LMICs)*

Vaccination strategies ranked from lowest to the highest NNV

NNV=Number of doses needed to prevent 1 cervical cancer; Vaccination coverage=80%



* Update of Bénard et al. Lancet Global Health 2025

All NNVs are incremental. **SCENARIO**: 1-dose routine and MAC vaccination for all age groups. 1-dose VE=100% and VD=lifelong.

Next Steps

- Await SAGE recommendations
- NAGI review of those recommendations in the context of South Africa's epidemiology including consideration of PLHIV, whether to extend the age to extend to (both older and younger), programmatic delivery including for PLHIV, cost-effectiveness, impact, communication
- NAGI will also consider whether to recommend the nonovalent vaccine
- Recommendations go to the NDOH and to the Minister for consideration

Thank you

Sinead Delany-Moretlwe, Wits RHI

Marc Brisson, Universite Lavan

Andy Pollard, Oxford University

Paul Bloem, WHO

Kate O'Brien, WHO

Susie Cornell, Wits RHI

Members of the SAGE Working Group

Members of the NAGI Working Group

All the authors of the cited papers and all the women and men who participated in the many pieces of research referenced here