

Evaluating the impact vaccinating older cohorts: the effect of transmission blocking

IPVC 2025

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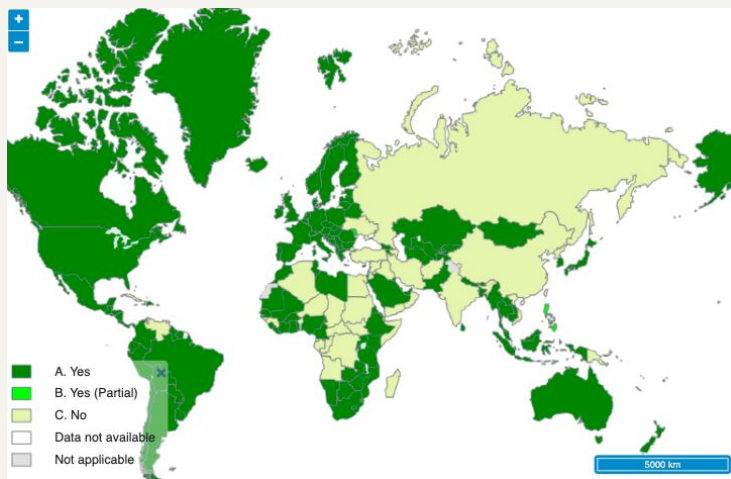
Recent increases in HPV vaccination coverage mean that more girls than ever are protected from HPV infection—but some girls are left behind

HPV vaccines provide excellent protection against HPV infection...

- Data from clinical trials and ongoing research show that HPV vaccination provides long-lasting protection.
- Protection by HPV vaccination lasts for **>10 years** without becoming less effective^{1,2,3,4}
- Decreases in prevalence of vaccine-type HPV infections and cervical precancers have been observed in many countries with HPV vaccination programs.^{5,6,7}
- Studies are ongoing to further evaluate the duration of protection.
- No data indicate that the protection from HPV vaccination lessens over time

... and with increasing coverage levels, more and more girls are protected...

- As of February 28, 2025, 148 WHO member states have incorporated the HPV vaccine into their national immunization programs.⁸
- Weighted average coverage of the first dose of HPV vaccination in girls aged 9–14 years: **61.6%**



... but routine vaccination coverage will never reach 100%

- School-based delivery programs will miss out-of-school girls
- Girls may be absent from school or otherwise unwilling/unable to be vaccinated
- Parents may not wish for their child to be vaccinated

How can we prevent cervical cancers in girls who haven't been vaccinated?

Vaccinating older girls / young women who've already acquired HPV could indirectly benefit the population at large, especially if the vaccines have a transmission-blocking mechanism, so girls with HPV are less likely to transmit to their partners.

A study to assess the population-level impact of vaccinating older girls assuming some transmission-blocking: objectives, design, and setting

Objectives

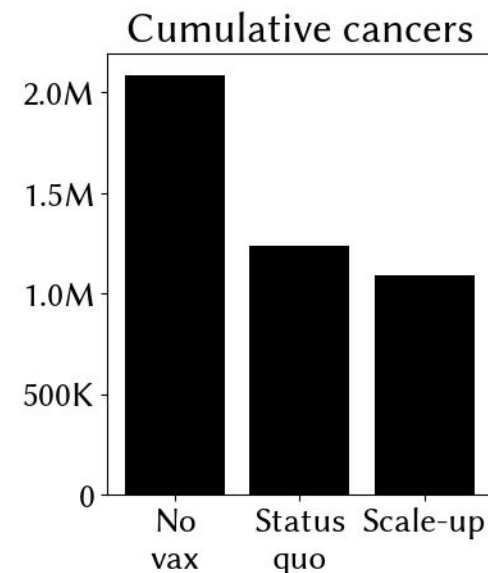
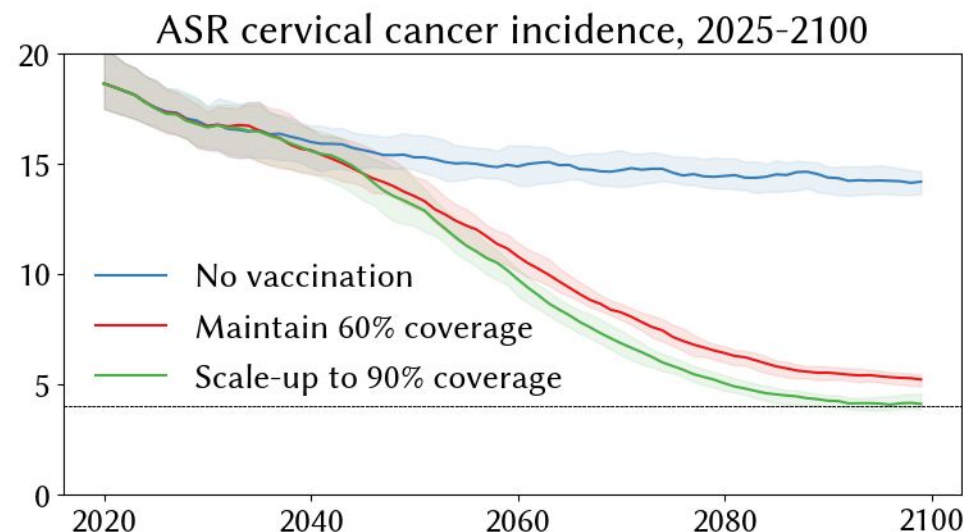
- Inform data collection prioritization
- Generate discussion on potential study design
- Improve delivery strategies

Study design

- Use an agent-based model (HPVsim¹) with structured sexual network
- Calibrate the model to Nigeria
- Use the model to investigate scenarios with varying levels of vaccination coverage and presumed efficacy at blocking transmission

Setting: Nigeria

- ASR of cervical cancer incidence: 18²
- ~12,000 cases/year²
- HPV vaccination introduced in 2023 targeted at 9-14yo girls – with catch-up for 15-26 out of pocket
- Vaccination coverage estimates have increased from 30% in 2023 to ~60% in 2024³
- Single-dose regimen introduced



Scenarios, assumptions, and results

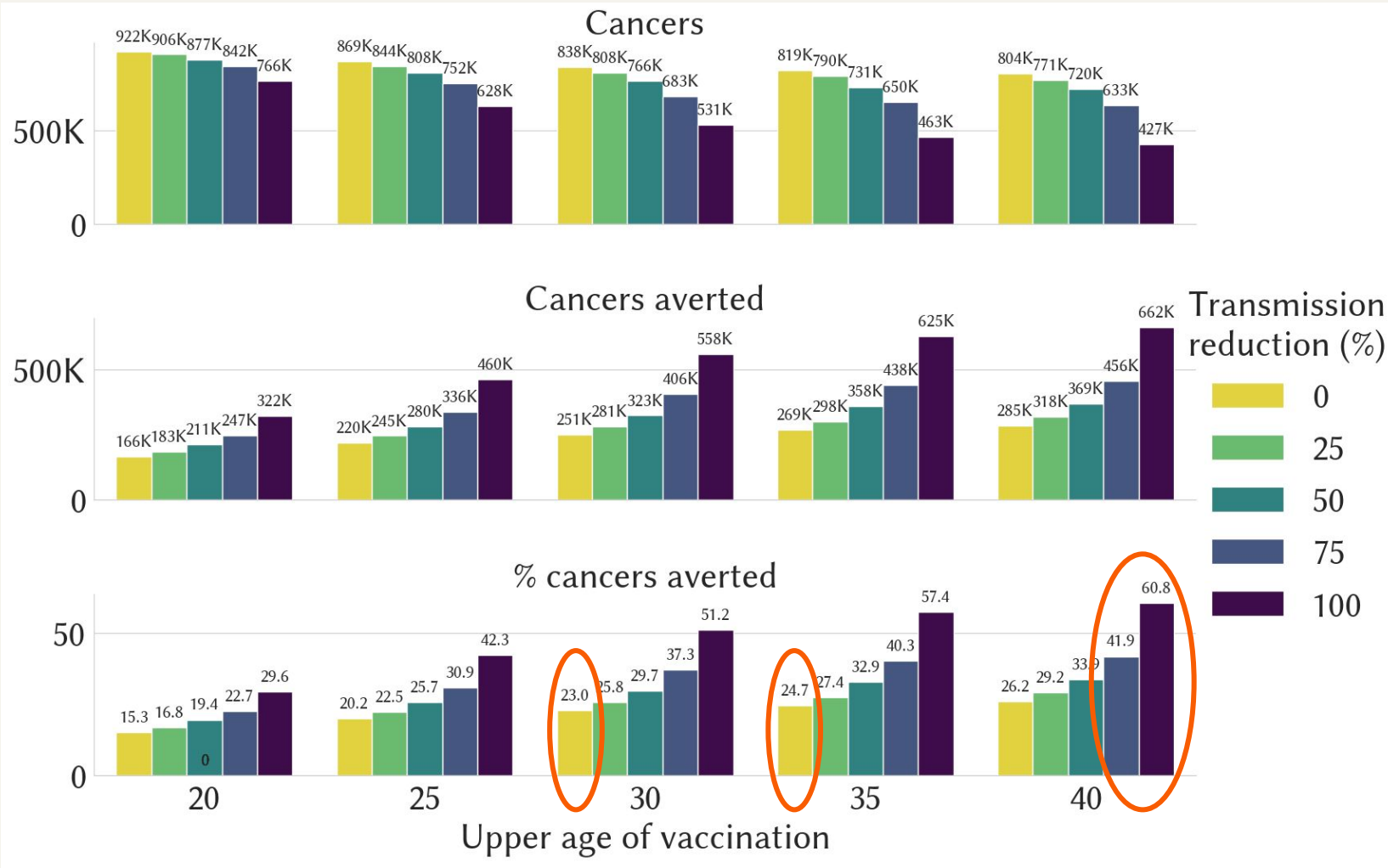
Vaccinating women up to age 20/30/40 could avert up to an additional 30/50/60% of residual cancers over 2025-2100

Scenarios and assumptions

- Assuming 90% coverage of 9yo girls from 2025
- Examine an additional, one-off vaccination campaign targeted at females 14-20, 14-25, 14-30, 14-30, 14-40, achieving 90% coverage

Key results

- If the vaccine is 75-100% effective at blocking transmission, this campaign could avert 40-60% of residual cancers over 2025–2100 if delivered to 90% of women <40
- Without a transmission-blocking effect, minimal benefit to vax >30



Conclusions & acknowledgments

Conclusions

- Scaled-up routine vaccination will avert ~1M cancers over 2025–2100 in Nigeria, but there will still be ~1M cancers cases remaining (assuming no scale-up in screening)
- Vaccinating older cohorts would be particularly impactful if there's a transmission blocking effect, with additional reductions in residual burden as below:

	0% redux	25% redux	50% redux	75% redux	100% redux
Upper age: 20	15%	17%	19%	23%	30%
Upper age: 30	23%	26%	30%	37%	51%
Upper age: 40	26%	29%	34%	42%	61%

- **Understanding transmission blocking mechanics is essential for evaluating the value proposition of extending vaccination to older cohorts**

Limitations/extensions

- Not considering the effect of screening
- Not accounting for costs or cost-effectiveness
- Results are likely to vary by geography and are highly dependent on sexual behavior
- Coverage levels are optimistic

Acknowledgments

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Thank you!